Definium™ AMX 700
X-Ray System

Operator Manual

5161515-1EN

Rev. 6 (10 February 2008)

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Green QSD 1990 Standard issued by MDD (Medical Devices Directorate, Department of Health, UK).

Medical Device Good Manufacturing Practice Manual issued by the FDA (Food and Drug Administration, Department of Health, USA).

Underwriters' Laboratories, Inc. (UL), an independent testing laboratory.

Canadian Standards Association (CSA).

International Electrotechnical Commission (IEC), international standards organization, when applicable.

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Revision History

Rev #	Date	Pages Affected	Reason for Change
1	09 Dec. 2005	All	Initial release.
2	27 Mar. 2006	1-1	Updated description of unit.
		2-5	Inserted warning about inserting fingers into the Ethernet port.
		3-2	Added cross-references in table 3-1. Added wireless antenna information in table 3-1.
		3-3	Added cross-references in table 3-1.
		3-4	Added notes and information about the detector bin in table 3-1.
		3-5	Inserted warning about inserting fingers into the Ethernet port in table 3-1.
		5-3	Procedure re-written (all text before figure 5-2).
		6-3	Battery drain percentages revised, figure 6-2 replaced.
		6-4	Removed note before “Bar Graph Display vs. Battery Loading” section Updated Approximate Discharge Rate and Typical Daily Usage numbers in table 6-2.
		6-5	Figure 6-3 replaced.
		6-6	Added 2 “IMPORTANT!” notes after step 5.
		6-7	Moved “Main Power Circuit Breaker” information from the Maintenance and Service chapter. Figure 6-5 replaced.
		7-1	Switched order of “Maintenance” and “Messages” chapters.
		7-2	Updated descriptions of “Battery Too Low” and “Charge Required” messages in table 7-1.
		8-1	Updated approved cleaning chemical list.
		A1-5	Added weight in kilograms caution in Figure A1-3.
		A1-6	Updated table A1-2, detector status lights.
		A1-7	updated list “Do not do”.
		A1-8	Updated external ambient temperature range in table A1-3.
		A1-10	Removed references to the grid holder.
		A1-11	Added grid handling instructions.
		A2-3	Added start up instructions.
		A2-7/8	Added wireless network connection section.
		A2-9	Added step to system reset procedure (step 3).
		A2-11	Removed paragraph before figure A2-10.
		A3-6	Added “network connection status” and “wireless network connection status” rows to table A3-1.
		A3-8	Corrected description of Accession number in table A3-2.
		A3-9	Corrected first bullet below step 3.
		A3-20	Corrected description of Accession number in table A3-4.

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2	(continued)	A4-2	Changed the warning into a note in the “switch screen tab” row of table A4-1.
		A4-4	Removed Small and Large Pediatric from the list of patient sizes in table A4-1.
		A4-6	Added “wireless connection status” row to table A4-1.
		A4-10	Removed Small and Large Pediatric from the list of patient sizes in note below step 3.
		A4-11	Added tech switch to step 11. Added screen text to paragraph before figure A4-7.
		A4-12	Added note and process before step 1.
		A4-12	Added step 4. Corrected step 5. Added note after step 5.
		A5-4	Added “network connection status” and “wireless network connection status” rows to table A5-1.
		A6-4	Added descriptions of “PACS Test Images” and “TG-18 Samples” to Image Tools row of table A6-1. Added to the description of “Patient Information” button in table A6-1
		A6-5	Added “network connection status” and “wireless network connection status” rows to table A6-1.
		A7-7	Added wireless network connection trouble shooting steps to “Failed C-echo Test”.
		A7-30	Updated steps 2-4.
		A7-32	Added “Enable or Disable Technical Mode” section.
		A7-33	Added Exam section.
		A7-35	Updated step 6.
		A8-3	Updated note at top of page. Added last bullet to list under “Quality Test Preparation”.
		A8-4	Updated step 2.
		A8-7	Added paragraph and IMPORTANT note before figure A8-8.
		A8-8	Updated step 2. Updated note below step 4.
		A8-9	Updated caption of figure A8-12.
		A8-9 -- 11	Re-wrote process steps 5-13.
		A8-15	Updated approved cleaning chemicals list. Added Grid Cleaning section.
		B-15	Updated second, third, and fourth paragraphs of section.
3	12 Jul. 2006	2-5	Added new warning in accordance with FDA requirements. Deleted redundant caution.
		6-3	Changed “Slow Charging” to “Standby Mode” and updated description of function.
		6-5	Changed “Slow Charging” to “Standby Mode” and updated procedure.

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3	(continued)	8-2	Changed row in table 8-1, “SLOW CHARGING” to “STANDBY” and updated description of message.
		A2-2	Replaced figure A2-1.
		A2-4	Added cross-references to “Software Reset” section.
		A2-8	Added new procedure for switching between wired and wireless connections.
		A2-8	Added note that software reset does not require shut down or reset.
		A6-12	Removed that CD-RW disks may be used to copy exams, added note that the system cannot write to CD-RW disks.
		A6-13	Added new step 8 to confirm that images have been written to the CD.
		A7-1	Re-wrote chapter introduction.
		A7-14 -- 15	Added notes in table A7-6, in the “Plus Previous” and “Plus Future” rows.
		A7-26	Changed text in table A7-9, clarified what happens to images without the Auto Tag mark upon auto delete.
		A7-31	Added new descriptions of DEI displays to the options listed after step 2.
		A7-32	Changed description of Technical Mode.
		A7-33 -- 40	Re ordered the Image Processing sections, updated information to match current system.
		A7-44	Removed that CD-RW disks may be used to copy protocol database, added note that the system cannot write to CD-RW disks.
		A7-50	Removed “Unpaired” as an option for Laterality.
		B-13	Changed text in table B-1, row Inactivity Timeout. Added that this function is not implemented and that changing the settings may cause conflicts with system software. Removed most of the description.
4	29 Sep. 2006	All	Miscellaneous typographical and grammatical corrections.
		3-4	Deleted information from table 3-1, row 15, regarding opening and closing the detector bin. Unit design has changed so that it is always open.
		4-4	Deleted information from step 3 regarding closing the detector bin.
		4-7	Inserted note regarding that the tether should be removed from the column holder before rotating the column.
		7-1	Added cross-reference to Chapter A1: Detector Overview-Handling and Cleaning.
		A1-1 -- 13	Re-ordered chapter to better suit end-user needs.
		A1-2	Corrected information in “Detector Functions” section.
		A1-3	Corrected information in “Panel” section. Corrected information in “Electronics” section. Corrected information in “Physical Appearance / Finish” section.
		A1-4	Corrected information in “Nameplates and Markings” section. Corrected information in “Detector Alignment” section.
		A1-5	Updated information in table A1-1.
		A1-6	Added section on “Electro-magnetic Interference”.

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Rev #	Date	Pages Affected	Reason for Change
4	(continued)	A1-7	Moved "Detector Grid" section and added information that the arrow indicates line direction. Added sentence to be careful to not pinch fingers or clothing when putting the grid on the detector.
		A1-8	Corrected warning to not swing detector into corners. Corrected text to check the detector for cracks. Added item to end of list to not use a defibrillator when the detector is in contact with the detector. Corrected text regarding the detector finish. Added warning to keep the detector away from large amount of liquid and that the detector cannot be immersed.
		A1-9	Added new section on tether handling and care. Changed the cross-reference in the "Grid Handling" section.
		A1-9 --10	Added new section on cleaning the detector, grid, and tether.
		A1-10	Corrected the specifications in table A1-2.
		A8-2	Deleted table A8-1, removed information about testing factors.
		A8-5 --14	Replaced all figures with new images.
		A8-11	Corrected failed QAP information.
		A8-14	Removed most text from "Cleaning" section and replaced it with a cross-reference to Chapter A1: Detector Overview-Cleaning.
5	17 Nov. 2006	A5-4 A5-21 --22 A7-30 --32	Changed "Dose Exposure Indicator" to "Dose Exposure Index".
6	10 Feb. 2008	7-1	Added Bleach (50% solution) to list of approved cleaning agents. Changed maximum solution strength of Isopropyl Alcohol to 70%.
		A1-10	Added Bleach (50% solution) to list of approved cleaning agents. Changed maximum solution strength of Isopropyl Alcohol to 70%.
		A2-3	Added international keyboard configuration.
		A4-10	Updated number of seconds for acquired image to appear on the Viewer screen.
		A5-20	Added additional guidance for correcting high and low DEI.
		B-13	Added clarification about inactivity time out.
		All	Miscellaneous grammatical and typographical corrections.

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Chapter 1: About this Guide

This chapter explains the purpose and design of this Learning and Reference Guide. It is an introduction to the guide, providing information on the purpose, prerequisite skills, guide organization, chapter format, and graphic conventions that identify the visual symbols used throughout the guide.

The instructions in this operation manual are for use with the Definium AMX 700, model numbers 5151481-3 and 5151481-4

Topics covered include:

- About the Definium AMX 700 (p. 1-1)
- Safety Information (p. 1-1)
- Graphic Conventions and Legends (p. 1-2)
- Safety Notices (p. 1-3)

About the Definium AMX 700

The Definium AMX 700 is a mobile x-ray machine that acquires digital radiographic images with the same quality as a full scale x-ray room.

Figure 1-1 Definium AMX 700 in use

Safety Information

Please refer to Chapter 2: Safety and Regulatory in this Learning and Reference Guide. The Safety chapter describes the safety information you and the physicians must understand thoroughly before you begin to use the system. Note that you will find additional safety information throughout your Learning and Reference Guide. If you need additional training, seek assistance from qualified GE Medical Systems or GE Healthcare personnel. The equipment is intended for use by qualified personnel only. This guide should be kept with the equipment and be readily available at all times. It is important for you to periodically review the procedures and safety precautions. It is important for you to read and understand the contents of this guide before attempting to use this product.

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Graphic Conventions and Legends

Table 1-1 describes the conventions used when working with menus, buttons, text boxes and keyboard keys.

Table 1-1 Conventions for menus, buttons, text boxes, and keyboard keys

Convention	Description
Select	• Marking an option in a group of check boxes or radial buttons • Choosing an option from a drop-down list • Activating a tab • Highlighting text • Highlighting row items
Press [START EXAM]	Pressing a button on a workstation screen.
In the **Matrix** text box,...	The name of text box in which you can select or type text or the name of a drop-down list from which you select an option.
Type **DICOMAE** in the...	Text you enter into a text box.
Select **Preferences > Worklist**.	The path of selecting option(s) in a tree structure.

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Safety Notices

The following safety notices are used to emphasize certain safety instructions. This guide uses the international symbol along with the danger, warning, or caution message. This section also describes the purpose of a Note.

DANGER: **Danger is used to identify conditions or actions for which a specific hazard is known to exist which will cause severe personal injury, death, or substantial property damage if the instructions are ignored.**

WARNING: **Warning is used to identify conditions or actions for which a specific hazard is known to exist which may cause severe personal injury, death, or substantial property damage if the instructions are ignored.**

CAUTION: **Caution is used to identify conditions or actions for which a potential hazard may exist which will or can cause minor personal injury or property damage if the instructions are ignored.**

NOTE: A Note provides additional information that is helpful to you. It may emphasize certain information regarding special tools or techniques, items to check before proceeding, or factors to consider about a concept or task.

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Chapter 2: Safety and Regulatory

This chapter explains the safety considerations, general equipment and patient related precautions, and the symbols used for the safe operation of your equipment. This chapter also includes information about the emergency procedures.

This chapter presents the concepts necessary to operate your system safely.

Topics covered include:

- X-Ray Protection (p. 2-1)
- Certified Electrical Contractor Statement (p. 2-3)
- Regulatory Requirements (p. 2-3)
- Disposal of Waste (p. 2-4)
- Safety First (p. 2-4)
- Good Operating Practices (p. 2-5)
- IEC 60601-1 Classifications (p. 2-6)
- Applicable Symbols (p. 2-6)

X-Ray Protection

X-ray equipment if not properly used may cause injury. Accordingly, the instructions herein contained should be thoroughly read and understood by everyone who will use the equipment before you attempt to place this equipment in operation. GE Healthcare, will be glad to assist and cooperate in placing this equipment in use.

Although this apparatus incorporates a high degree of protection against x-radiation other than the useful beam, no practical design of equipment can provide complete protection. Nor can any practical design compel the operator to take adequate precautions to prevent the possibility of any persons carelessly exposing themselves or others to radiation.

It is important that everyone having anything to do with x-radiation be properly trained and fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Avenue, Room 1016, Bethesda, Maryland 20814, and of the International Commission on Radiation Protection, and take adequate steps to protect against injury.

The equipment is sold with the understanding that GE Healthcare, its agents, and representatives have no responsibility for injury or damage which may result from improper use of the equipment.

Various protective material and devices are available. It is urged that such materials or devices be used.

CAUTION: United States Federal law restricts this device to use by or on the order of a physician.

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Radiation Protection

This device emits x-ray radiation for medical purposes. Each Definium AMX 700 has been tested for leakage radiation and the test results are recorded in the final test protocol. As radiation is harmful to human body, the necessary safety precautions must be observed and the radiation protection regulations of individual countries must be complied with. The user must have a permission to use x-ray device for diagnostic purposes.

Scattered radiation is produced during x-ray examinations, this is why radiation protection means should be used. Prior to examination, it is recommended to make sure that the physician knows if the female patient is pregnant. If someone has to be close to the patient, protective clothing must be used.

Additional protection against scattered radiation is achieved when using the hand exposure switch at not less than 2 meters from the focal spot and the x-ray beam. The full extended spiral cable length of the hand switch is approximately 4 meters.

CAUTION: The x-ray beam may extend beyond the primary protective shielding. Use lead backed cassettes or digital detector. Do not stand behind the receptor and/or in-line with the x-ray beam.

CAUTION: There should be no people other than the patient in the exam room during x-ray exposure. If circumstances require another person to enter the room while x-ray exposures are planned or possible, that person should wear a lead apron in accordance with accepted safety practices.

CAUTION: Use the largest possible focal spot-to-skin distance to keep the patient absorbed dose as small as possible.

CAUTION: This x-ray unit may be dangerous to patient and operator unless correct exposure factors and operating instructions are observed.

CAUTION: Always provide necessary radiation protection for your patient and yourself when operating any x-ray system.

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Certified Electrical Contractor Statement

All electrical installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing shall be performed by qualified GE Medical personnel. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE's field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

CAUTION: Only trained and qualified personnel should be permitted access to the internal parts of the Definium AMX 700 or its associated assemblies.

Regulatory Requirements

NOTE: This equipment generates, uses, and can radiate radio frequency energy. The equipment may cause radio frequency interference to other medical and non-medical devices and radio communications. To provide reasonable protection against such interference, the Definium AMX 700 complies with emissions limits for a Group 1, Class A Medical Devices as stated in EN 60601-1-2.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment is found to cause interference (which may be determined by switching the equipment on and off), the user (or qualified service personnel) should attempt to correct the problem by one or more of the following measure(s):

- Reorient or relocate the affected device(s).
- Increase the separating space between the equipment and the affected device.
- Power the equipment from a source different from that of the affected device.
- Consult the point of purchase or service representative for further suggestions.

The manufacturer is not responsible for any interference caused either by the use of interconnect cables other than those recommended, or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

To comply with the regulations applicable to an electromagnetic interface for a Group 1, Class A Medical Device, all interconnect cables to peripheral devices must be shielded and properly grounded. Use of cables not properly shielded and grounded may result in the equipment causing radio frequency interference in violation of the European Union Medical Device directive and FCC regulations.

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Disposal of Waste

This symbol indicates that the waste of electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.

Figure 2-1 Disposal of Waste symbol

Safety First

This equipment is to be used by authorized medical personnel only.

Your Definium AMX 700 is engineered for years of reliable service. To promote optimum safety, be sure to read this manual carefully, before operating the unit.

WARNING: This X-Ray unit may be dangerous to patient and operator, unless safe exposure factors, operating instructions and maintenance schedules are observed.

To be used by authorized personnel only.

WARNING: Electric shock hazard. To prevent possible electric shock, do not insert fingers inside the RJ 45 connector (Ethernet port). Refer to Chapter 3: Hardware Overview-Unit Features (p. 3-1) for more information about the location of the Ethernet port.

CAUTION: Always be alert to safety when you operate this equipment. You must be familiar enough with the equipment to recognize any malfunctions that can be a hazard. If a malfunction occurs or a safety problem is known to exist, isolate the unit to avoid unauthorized operation, and do not use this equipment until qualified personnel correct the problem.

CAUTION: The Definium AMX 700 is not connected to protective earth ground while in use. For the safety of the patient and operator, only devices that are certified to the appropriate safety standards for medical devices and in good working order are to be used in proximity to the Definium AMX 700.

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CAUTION: THIS SYSTEM IS NOT DESIGNED FOR USE IN CLOSE PROXIMITY TO A DEFIBRILLATOR!

Never use a defibrillator on a patient that remains in contact with the digital detector or any part of the mobile x-ray system. This system must be treated as a conductive surface and moved well away from a patient before defibrillation is attempted. If any part of the mobile x-ray system remains in contact with a patient when the defibrillator is discharged, voltage may be conducted through the patient's body and into the system. This may be hazardous to anyone who may come in contact with the system, and could damage the detector.

Always consult the instructions for use of any defibrillator that may be used on a patient being imaged by this digital mobile x-ray system.

CAUTION: If the GE Portable DR Detector is used in a fixed installation, it is the User's responsibility to provide the means for audio and visual communication between the Operator and the patient.

CAUTION: If you suspect any electromagnetic interference affecting or caused by the unit, call service. Portable and mobile RF communications equipment can affect medical electrical equipment.

CAUTION: This equipment is not rated for use in the presence of flammable gases.

Good Operating Practices

- Wear a lead apron while performing an x-ray exam.
- Step back at least 6 feet (1.8 meters) from the tube or to the full extension of the hand switch cord before making an exposure.
- Always use the proper field sizes and technic factors for each procedure to minimize x-ray exposure and produce the best diagnostic results.
- Check the digital display carefully before making an exposure: verify that the selected technique is the intended technique. Pay particular attention to the placement of the decimal point in the mAs setting to insure that whole numbers are not mistaken for an intended mAs fractional number.
- When x-raying bed patients, move them as far as possible from nearby patients.
- Ask visitors to step outside the room during an exposure.
- Use gonadal shields for patients whenever possible.
- Be sure to read and follow the maintenance schedule outlined in the Maintenance and Service section of this manual.

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- Under most conditions, cumulative radiation dose to the operator will not exceed recommended maximum permissible levels. However, as with all radiation-producing devices, a qualified radiation expert should evaluate situations involving frequent exposures using high kVp and mAs technics to determine if extra protective devices are necessary.

IEC 60601-1 Classifications

- Type of protection against electric shock: Class I, Internally Powered
- Degree of protection against electric shock: Type B Applied Part
- Degree of protection against ingress of water: Ordinary
- Mode of operation: Continuous

Applicable Symbols

Table 2-1 Symbols

Symbol	Definition
	This symbol on the equipment means that the accompanying operating instructions should be consulted to assure safe operation.
	Store and operate the detector within the range of 0° to 50°C (32°-122°F) to avoid damage.
	To avoid damage do not place a load in excess of 160kg (350lb) on the detector.
	In accordance with UL 60601-1, the Definium AMX 700, is classified as Type B Equipment, Class I Equipment, Internally Powered Equipment, Ordinary Equipment and continuous operation. Type B Equipment provides an adequate degree of protection against electric shock, in particular regarding: • allowable leakage current, • reliability of the protective earth connection
	Dangerous voltage. Indicates an avoidable dangerous high voltage hazard.
	Alternating Current. Indicates equipment that is suitable for alternating current only.

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Symbol	Definition
	Protective earth (ground). Identifies any terminal which is intended for connection of an external protective conductor to protect against electrical shock in case of a fault.
	Functional Earth (ground) Terminal. Terminal directly connected to a point of a measuring supply or control circuit or to a screening part which is intended to be earthed for functional purposes.
	Battery power off. This does not remove mains voltage.
	Battery power on. This does not apply mains voltage.
	Indicates radiographic control.
	Indicates non-ionizing radiation is present.
	Indicates ionizing radiation is present.
	X-ray emission. X-ray tube head is emitting x-rays. Take adequate precautions to prevent the possibility of any persons carelessly, unwisely, or unknowingly exposing themselves or others to radiation.
	Indicates positioning lock or brake release.
	Indicates terminal and receptacle location for hand-held radiographic and light field control.

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Symbol	Definition
	Control for indicating radiation field by using light.
	Collimator blades closed. The controlled blades are shown in thicker lines.
	Collimator blades open. The controlled blades are shown in thicker lines.

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Chapter 3: Hardware Overview

Topics covered include:

- Unit Features (p. 3-1)
- Control and Display Panel (p. 3-5)
- Hand Switch (p. 3-6)
- TechSwitch (p. 3-7)
- Options and Accessories (p. 3-9)

Unit Features

Since the Definium AMX 700 is battery operated, there's no need to plug in your mobile x-ray unit before taking exposures. Battery operation makes the Definium AMX 700 easily adapted to operating, intensive care, and emergency room applications.

Because of a dual-motor drive, driving and positioning the Definium AMX 700 requires minimum effort. And the control panel's cut-away design permits optimum visibility for steering down crowded corridors.

The self-stopping bumper, one of many built-in safety devices, helps prevent unwanted mobility—the motors stop and the brakes activate upon contact with another object.

Table 3-1 describes the Definium AMX 700 features shown in Figure 3-1.

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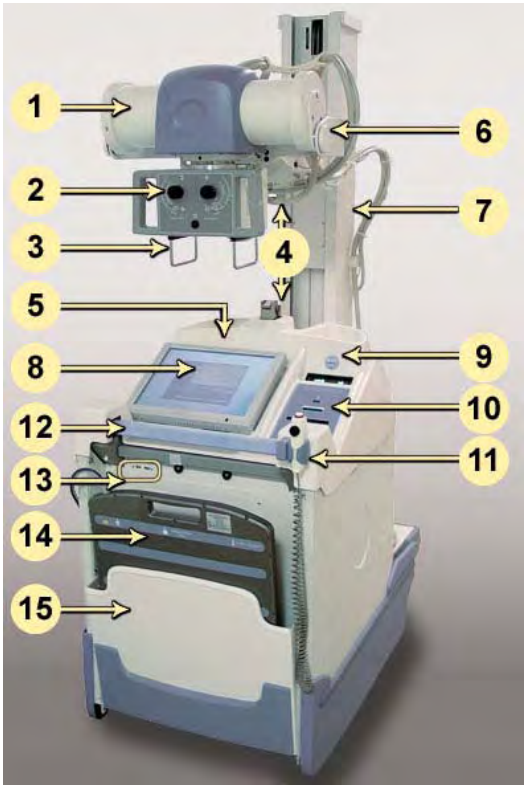
Figure 3-1 Definium AMX 700 back and front

Back



Front

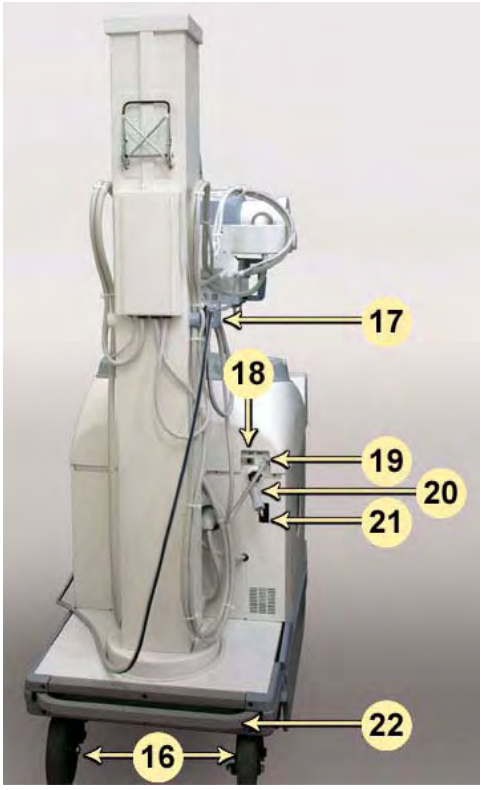


Table 3-1 Definium AMX 700 features

Item	Description
1	Tube head. Refer to Chapter 4: Moving and Positioning-Position the Tube (p. 4-5) for more information.
2	Collimator controls. Refer to Chapter 4: Moving and Positioning-Adjust the Collimator (p. 4-7) for more information.
3	Collimator skin spacing bars.
4	Tube latch mechanism. Locks the tube head down during transport. Refer to Chapter 4: Moving and Positioning-Latch Lock Release (p. 4-5) for more information.
5	Wireless antenna. Connects the unit to the facility network for the transfer of images and HIS or RIS data. Refer to Chapter A2: General Information-Wireless Network Connection (p. A2-7) for more information about using the wireless connection.
6	Telescopic arm. The arm extends for tube placement. Refer to Chapter 4: Moving and Positioning-Adjust Column and Telescoping Arm (p. 4-6) for more information.

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Item	Description
7	Column. The column rotates for tube placement. The tube moves vertically on the column. Refer to Chapter 4: Moving and Positioning-Adjust Column and Telescoping Arm (p. 4-6) for more information.
8	LCD touch screen. The screen provides the means to take and view x-rays. Refer to Appendix A: GE Portable DR Detector Operating Instructions for more information.
9	On/Off Key Switch. Refer to Chapter 4: Moving and Positioning-Turn Unit On (p. 4-1) for more information.
10	Display and control panel. Displays the status of the battery charge. When in acquisition mode, displays the currently selected kVp and mAs and any system status messages or errors. Refer to Control and Display Panel (p. 3-5) for more information.
11	Hand switch for initiating exposures. Refer to Hand Switch (p. 3-6) for more information. **NOTE:** Some models may have a wireless "TechSwitch" in addition to the hand switch. Refer to TechSwitch (p. 3-7) for more information.
12	Drive handle. Grasp the drive handle and squeeze the release bar to move the unit.Refer to Chapter 4: Moving and Positioning-Drive the Unit (p. 4-1) for more information.
13	USB ports (between the drive handle and the detector). Allow you to connect USB accessory devices, such as an external CD drive. There are also two USB ports on the front of the unit. Refer to item 18.
14	GE Portable DR Detector and grid. Refer to Appendix A: GE Portable DR Detector Operating Instructions for more information.

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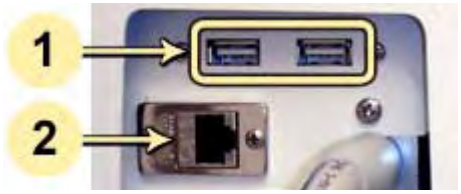
Item	Description
15	Detector bin. Provides a space to keep the detector and grid. **NOTE:** The detector must be placed in the bin before driving the unit. The bin contains sensors to determine if the detector is in the bin. If the detector is not in the bin, the unit will not drive at full speed. **NOTE:** Make sure that the detector is in the bin **before** beginning a cassette exam. Exposures will be inhibited if the detector is placed in the bin after the exam has begun. To clear the inhibit, either: – Select a different view and then reselect the view you wish to perform (recommended). – Remove the detector from the bin for the duration of the exam. Refer to Chapter A4: Image Acquisition-Conduct a Cassette Exam (p. A4-10) for more information.
16	Front wheels.
17	Detector tether holder. Provides a place to wrap the tether cord during transport or when being stored.
18	Ports  1. USB ports. Allow you to connect USB accessory devices, such as an external CD drive. There are also two USB ports on the back of the unit. Refer to item 13. 2. Ethernet network port. Connects the unit to the facility network for the transfer of images and HIS or RIS data. **WARNING: Electric shock hazard. To prevent possible electric shock, do not insert fingers inside the RJ 45 connector (Ethernet port).**
19	Detector tether. Connects the detector to the unit. Refer to Appendix A: GE Portable DR Detector Operating Instructions for more information.

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Item	Description
20	Battery charging cord. The cord retracts into the body when moving. Refer to Chapter 6: Charging the Batteries for more information.
21	Main power circuit breaker. Refer to Chapter 6: Charging the Batteries-Main Power Circuit Breaker (p. 6-6) for more information.
22	Bumper. Automatically activates the brakes and turns off the drive motors upon contact, to help prevent accidents.

Control and Display Panel

Display and control panel. Displays the status of the battery charge. When in acquisition mode, displays the currently selected kVp and mAs and any system status messages or errors.

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Figure 3-2 Control and display panel

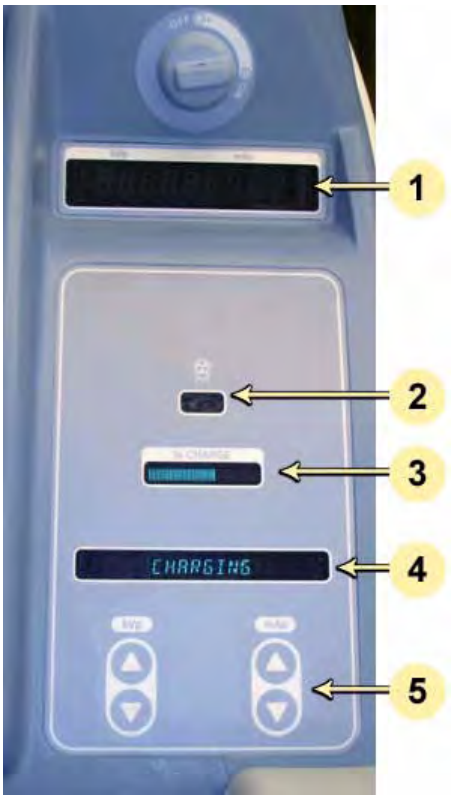

Table 3-2 Control and display panel functions.

Item	Description
1	kVp and mAs technique display when in acquisition mode.
2	Exposure indicator light. Lights up when exposures are taken.
3	Battery capacity indicator.
4	Battery charging status, system status, or error message display.
5	kVp and mAs technique controls (acquisition mode).

Hand Switch

Exposures are made with the console hand switch. The Prep/Expose button on this switch has three positions: OFF, PREP, and EXPOSE.

Some units may have a wireless TechSwitch to be used instead of the hand switch shown in Figure 3-3. Refer to TechSwitch (p. 3-7) for information.

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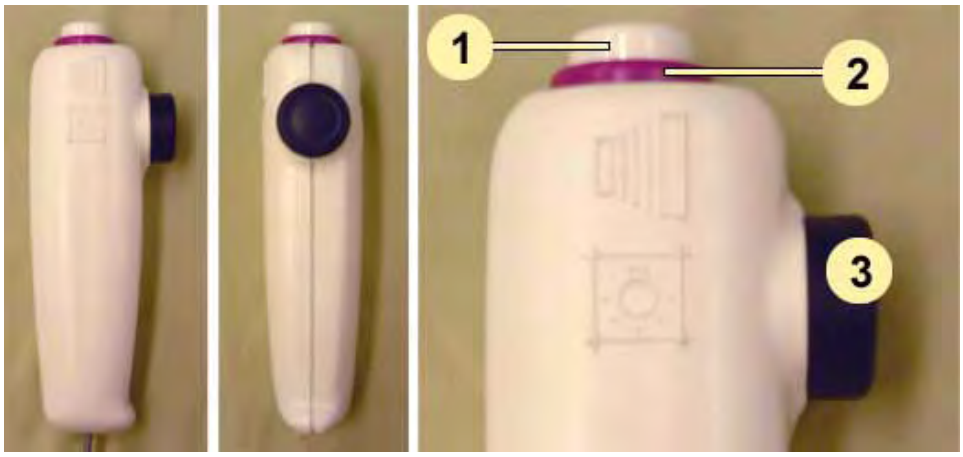
Figure 3-3 Hand switch



1. PREP
2. EXPOSE
3. Collimator Lamp Switch

Table 3-3 Hand switch button positions

Position	Description
OFF	The OFF position is when no pressure is applied to the Prep/Expose button on top of the hand switch.
PREP	PREP is the next position on the hand switch. When it is partially pressed, it brings the rotor up to speed and heats the filament. PREP also checks the system interlocks and verifies the system is ready to make an exposure. The button returns to the OFF position if released.
EXPOSE	The EXPOSE position is when the button on the hand switch is fully depressed. This produces X-rays that are recorded. Release the Prep/ Expose button after the exposure is completed.

TechSwitch

The TechSwitch option may be purchased for use with the Definium AMX 700. The remote TechSwitch can be used instead of the standard wired hand switch.

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Figure 3-4 TechSwitch

1. Transmitter
2. Cradle
3. Collimator Lamp Light button
4. Prep/Expose button

This section provides instructions for basic operation and maintenance of the TechSwitch. Refer to TS-TIM (4D) for complete installation instructions, service information, and specifications. This document is provided with the TechSwitch when purchased.

The TechSwitch has an operating range of 10.9 m (36+ feet) and operating radius of 180° relative to the infrared sensor on the back of the unit. TechSwitch will not operate through doors or walls. You must be in line of sight to the machine. TechSwitch will operate through windows and lead glass, but you must observe all guidelines for radiation protection and safety.

1. Set up the X-ray unit as required, observing all necessary guidelines for radiation protection and safety.
2. Take the TechSwitch transmitter out of its cradle.
3. Step back from the machine up to 10.9 m (36+ feet), and aim the transmitter at the infrared remote sensor.
4. To turn on the collimator lamp, press the Field Light button on the transmitter (optional function).
5. To PREP, press and release the Prep/Expose button on the transmitter. When the green 'Ready' indicator light on the X-ray machine control panel illuminates, you may make an exposure.
6. To make an exposure, press the Prep/Expose button on the transmitter a second time, and hold it down until the X-ray machine completes the exposure.
   - When the exposure is completed, an audible tone from the machine will sound, and the amber 'Exposure' indicator light on the control panel will illuminate.
   - After the exposure is completed, both the X-ray unit and TechSwitch system will automatically return to standby.
7. Re-cradle the transmitter.

NOTE: The transmitter must be put back in the cradle within three (3) minutes after use. If not replaced, the Remote Finder feature will activate, causing the transmitter to continuously sound a series of beeps.

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NOTE: The Collimator Lamp automatically deactivates upon prep. The Prep Cycle automatically drops out and returns to standby if an exposure is not initiated within ten (10) seconds, or if the collimator lamp is turned on. The exposure is automatically discontinued if the Prep/Expose button is released before exposure is complete.

Test the Battery

Activate the TechSwitch transmitter for five (5) seconds and observe the Low Battery Indicator. Should the indicator illuminate, replace the battery.

To test the additional spare TechSwitch transmitter: Set-up the X-ray machine to recharge the batteries. Observe the Green 'ON' LED on the internal TechSwitch PCB Electronics Package. With the Transmitter Unit in hand step back at least 24 feet (7 meters) from the X-ray unit, and cycle the TechSwitch system, observing the indicator lamps on the top panel of the PCB.

NOTE: No rotor boost or exposures will be made in this mode. Check to see that the TechSwitch system functions reliably at this range. If not, a new battery is required. This test should be performed quarterly or when a transmitter battery problem is suspected.

Replace Transmitter Battery

Remove the six screws from the gray back cover of the TechSwitch transmitter. Place a new 9-volt alkaline battery in the direction shown on the inside of the housing. Replace the back cover securing the six screws.

NOTE: The battery should be replaced every two years under normal usage to ensure uninterrupted operation.

Clean Transmitter Cradle

The TechSwitch remote Transmitter Unit and Transmitter Cradle have durable plastic casings that should retain their appearance for many years. Both should be periodically cleaned with a soft cloth slightly dampened with water and a mild soap or detergent.

Options and Accessories

Dose Area Product (DAP) Meter

Full field ion chamber with an integral display unit. The display unit contains electronics controlling total dose area product, system reset and system test.

- Provides easy to read real time information on patient dose.
- Allows for simple manual transcription of this information into patient records.

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External CD Drive

A removable CD-recordable drive is provided with the Definium AMX 700. The CD drive is used for the following tasks:

- Copying exams and images to a CD
- Loading images from a CD for viewing
- Backing up the protocol database or other system data

The CD drive connects to the unit through a USB port. Plug in the CD drive power supply and insert the connection cable into any USB port.

NOTE: The Definium AMX 700 does not have a dedicated space or storage area for the CD drive. It is recommended that the CD drive be disconnected and stored before moving the unit.

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Chapter 4: Moving and Positioning

This section describes how to drive the unit and position the x-ray tube for acquisitions.

Topics covered include:

- Turn Unit On (p. 4-1)
- Drive the Unit (p. 4-1)
- Position the Tube (p. 4-5)
- Mechanical Setup (p. 4-5)
- Latch Lock Release (p. 4-5)
  - Adjust Column and Telescoping Arm (p. 4-6)
  - Rotate the Tube (p. 4-7)
  - Adjust the Collimator (p. 4-7)

Turn Unit On

Refer to Chapter 7: Maintenance and Service-Periodic Maintenance by Service Personnel (p. 7-1) for important information about the circuit breaker.

1. Turn the key switch to the ON position.

Figure 4-1 Key switch

   - The unit performs diagnostics (self-tests to make sure everything is working correctly). This process takes a few seconds.

2. When the technique and battery status displays light up, the unit is ready for operation. TESTING COMPLETE will also briefly appear on the message display.
   - The unit may take 3 minutes for the digital detector software to boot up. You may drive the unit before the software finishes booting, but you cannot take acquisitions until the software is fully booted.
3. If SYSTEM -- XX FAILED is displayed, turn the unit OFF then ON again. If SYSTEM -- XX FAILED displays again, write down the alphanumeric code (XX represents the code) and contact your service representative.

Drive the Unit

A compact design and dual motor assembly makes driving and maneuvering the Definium AMX 700 an easy process.

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If moving down hallways or just traveling from one room to another, first make sure that the telescoping arm is properly positioned and securely latched and that the detector is also in the detector bin so that maximum speed can be reached.

Then, simply grip the drive handle (Figure 4-2) and steer the unit to your destination.

Figure 4-2 Drive handle

WARNING: Movement of the Definium AMX 700 x-ray unit could cause the horizontal arm to slide and strike an operator or patient if not latched properly. Latch telescoping arm properly before moving the unit.

WARNING: Do not drive or position the Definium AMX 700 unless standing directly behind it (Figure 4-3). Failure to do this may result in loss of control causing serious injury and equipment damage.

Figure 4-3 Proper driving position

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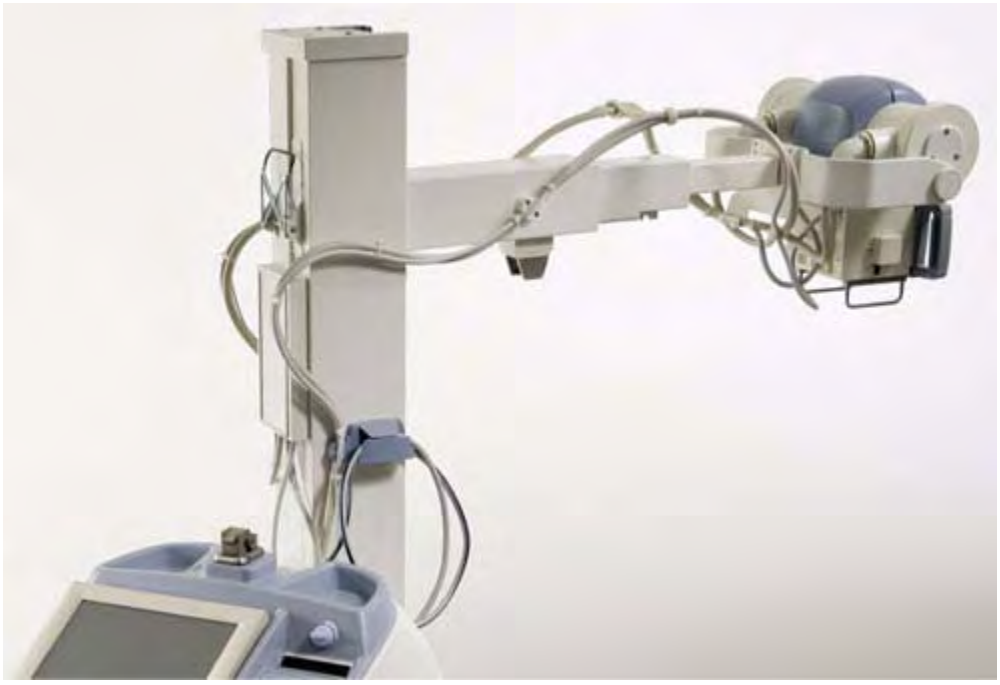
The drive automatically adjusts to your pace, and can be pushed forward, turned or pulled in reverse at speeds of up to 4.8 km per hour (3 m.p.h.).

A self-stopping bumper at the front of the unit automatically activates the brakes and turns off the drive motors upon impact, to help prevent accidents. If the bumper is engaged, simply grip the drive handle and pull the unit in reverse. (As with any mobile equipment, however, when driving the unit be sure to exercise reasonable care.)

With the telescoping arm extended for a patient exam, the Definium AMX 700 pivots on the spot, rotating and maneuvering easily for exact positioning. Again, grip the drive handle and turn the unit to the desired position.

Definium AMX 700 maneuvering speed is automatically reduced by 50 percent when the telescoping arm is extended or if the unit is driven when the detector is not in the detector bin.

Figure 4-4 Arm extended



To drive the Definium AMX 700, follow these steps:

1. Unplug the unit from the AC wall outlet and retract the cord, if necessary.

NOTE: Unit cannot be driven when plugged into the AC wall outlet.

2. Disconnect the network cable, if necessary.

CAUTION: **Remove the network cable before moving the unit to prevent damage to the system, cable, or facility network outlet.**

3. Place the detector in the detector bin and wrap the tether, if necessary.

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4. Lock the telescoping arm into the park/transport position, if necessary.
   - In the park/transport position the telescoping arm is:
     - completely pushed in;
     - centered over the control panel (collimator skin spacers within well); and
     - securely latched (Figure 4-5).

Figure 4-5 Telescoping arm latched

5. Turn the keyswitch to ON, if necessary.
6. Grip the drive handle to activate the motors and disengage the brakes. Now simply steer the unit, like a shopping cart, to your destination.
   - When climbing inclines or moving over carpeting or other rough surfaces the drive motors will automatically adjust to the floor surface.
   - When descending inclines or pushing the Definium AMX 700 to make it go faster, it may stop and display the message RELEASE HANDLE. If this happens, release the handle to clear the message and then continue with normal operation.
7. To stop the unit and activate the brakes, release your grip on the drive handle. Remember that the self-stopping bumper, upon impact, will turn off the drive motors and activate the brakes.
   - To reverse the unit, grip the drive handle and pull backwards. If the self-stopping bumper is engaged, after a brief pause reverse the unit.
   - To turn a sharp corner or rotate the unit, push one side of the drive handle (to the right or left) and pull on the other. The unit will turn or pivot easily.

If the drive motors should fail, press and hold the BRAKE RELEASE button (Figure 4-6), located just below the DRIVE HANDLE on the left bracket. Manually relocate the unit, and call service.

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Figure 4-6 Brake release button

NOTE: The unit may be driven while the system software is booting up.

Position the Tube

This section describes how to setup and position mechanical components of the Definium AMX 700. Steps for mechanical positioning are organized in the following way.

- Adjustment of column and telescoping arm
- Rotation of x-ray tube unit, and
- Adjustment of collimator

Mechanical Setup

Follow these steps to release the latch, vertical column and telescoping arm locks from the park/ transport position.

Make sure that the unit is turned ON.

Latch Lock Release

1. Grip the collimator handles to activate the switch. (You should hear a clicking sound.) With slight force, push the telescoping arm down to release latch and then raise up.
   - Note that you only need to grip one of the collimator handles (Figure 4-7) to activate the lock release system.

NOTE: Unlatching the tube will activate the monitor. The monitor turns off when the tube is latched to conserve battery power.

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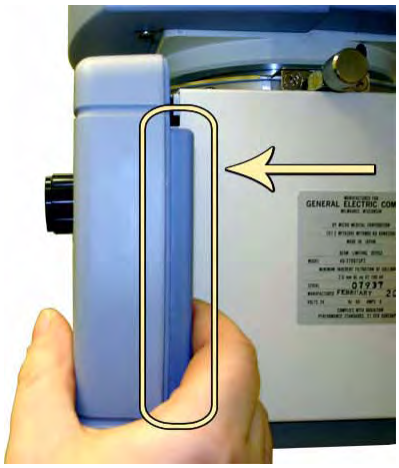
Figure 4-7 Lock release mechanism



Adjust Column and Telescoping Arm

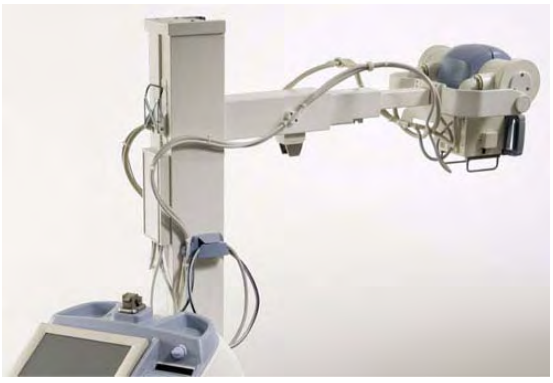
In the following steps you can free the Definium AMX 700 components for positioning in one of two ways: by gripping the collimator handle(s) to keep the lock system released or, whenever necessary, overriding the lock system with slight force.

When possible, we recommend that you use the lock release system.

IMPORTANT!: Remove the tether from the holder before rotating the column.

1. Rotate the arm and vertical column assembly to horizontally position the telescoping arm. The vertical column can be rotated 270 degrees clockwise or counterclockwise (detent at 0 degree park location). See Figure 4-8.
2. Raise the arm on the vertical column to the desired height.
3. Extend the retractable arm to the desired length and release. See Figure 4-8.

Figure 4-8 Extending the retractable arm



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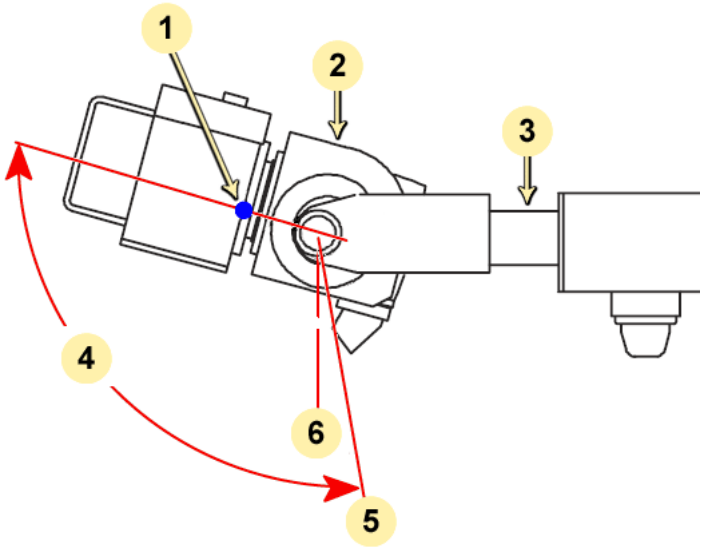
Rotate the Tube

Because the tube assembly is counterbalanced, no active lock is required. And little effort is needed to override friction and rotate the tube.

1. Use the collimator handles to position the tube to the desired angle.
   - You may rotate the tube in two directions:
     - clockwise and counterclockwise +180 degrees (detents at every 90 degrees), or
     - backwards -10 degrees and forwards +100 degrees (detent at 0 degree). See Figure 4-9.

Figure 4-9 Tube rotation



1. Collimator rotation knob
2. X-ray tube
3. Retractable arm
4. 110° (Forward)
5. -10° (Backward)
6. 0° Detent

Adjust the Collimator

The Definium AMX 700 manual collimator limits patient radiation exposure to a desired area at a given distance from the x-ray tube focal spot.

1. Press the field light button (on either the collimator face or hand switch) to activate the high-intensity field lamp. The cross-hair beam shows the field center
   - The field light is timed and automatically turns off 30 seconds after you release the switch. To adjust the field light timer, contact your service representative.
   - To activate the field light for another 30 seconds, press the button again when the light goes out. (You may keep the field light on for up to 4 minutes. After 4 minutes, the field light will turn off for cooling and remain inactive for 5 minutes.)
   - You may take an exposure while the field light is on; the light will automatically turn off when an exposure is taken.
2. Position the collimator and tube using the field light and cross-hair as guides. The cross-hair shows the field center. For fine positioning of the collimator, see Step 5.

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3. Use the tape measure on the side of the collimator to measure the SID (source-to-image distance).
4. Collimate by adjusting the size of the field with the two control knobs located on the front of the collimator (Figure 4-10).
   - For fine positioning of the collimator, see Step 5.
   - The left knob controls the transverse dimension of the blades. A diagram on the face of the collimator shows which knob controls which dimension (Figure 4-10).
   - Field size from 0x0 inches and up to 17x17 inches (43x43 cm) at the 40 inch (102 cm) SID can be obtained. The knob selectors indicate the field size for a selected SID.
   - Dial numbers on the calibrated scale are for a 40 inch (100 cm) and 72 inch (180 cm) scale SIDs.

Figure 4-10 Collimator controls

5. You may rotate the collimator about its vertical axis (that is, to the right or left) in two ways: by a simple 90° detent method or by a manual lock method for an angle other than 90°.
   - 90-degree detent method: Pull out the knob (Figure 4-11) and rotate the collimator to the desired 90° detent position. The detent will snap in place and lock.
   - Manual lock method: Pull out the knob, position the collimator to the desired angle (other than 90° detent), and turn the knob clockwise to secure. (Turn the knob counterclockwise to unlock the collimator and reposition.)

Figure 4-11 Collimator rotation knob

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Chapter 5: Taking Exposures

This chapter describes the procedures for working with the Definium AMX 700 unit hardware when acquiring images. Refer to Appendix A: GE Portable DR Detector Operating Instructions-Chapter A4: Image Acquisition for more information about the system software used to acquire, view, and manage images.

Topics covered include:

- Taking Exposures (p. 5-1)
- Technique Adjustment (p. 5-2)

Taking Exposures

Check the battery status and message displays for battery condition. In general, make sure that the unit battery is at more than half capacity before starting a shift.

It is important to note that you do not have to raise your kVp or mAs value to compensate for low battery capacity.

1. Position the unit and x-ray tube.
2. Position the patient and the detector.
3. Shield and collimate as appropriate.
4. Select the procedure from the Worklist. Refer to Appendix A: GE Portable DR Detector Operating Instructions-Chapter A3: Worklist for more information.
5. Select the anatomy and exam to perform. Refer to Appendix A: GE Portable DR Detector Operating Instructions-Chapter A4: Image Acquisition for more information.
   - The default technique selection will appear on the Acquisition screen and unit display panel.
6. Select the **Patient Size**.
7. Adjust the technique as appropriate.
   - The values displayed on the Acquisition screen and display panel will synchronize.
8. PREP with the hand switch or TechSwitch. Accelerating the rotor to proper speed takes about 3 seconds.
   - READY FOR X-RAY will appear on the message display.

NOTE: You may, if you wish, press the button all the way down to take an exposure. The 3 second prep cycle is automatic. (If PREP/EXPOSE positions are pressed simultaneously, READY FOR X-RAY will not display.)

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9. Press the PREP/EXPOSE button all the way down to take an exposure. (An audible tone will sound, and the X-RAY indicator will light up.)
   - If an exposure isn't taken within 10 seconds of pressing PREP, release and repeat the prep cycle. (Release the PREP/EXPOSE button, and press to prep position again.)
   - If the message WAIT appears, you may still take another exposure. Although, because of insufficient recovery time, the selected technique may be inaccurate. (Refer to Chapter 8: Messages on Display for a complete description of all x-ray messages.)
   - HEAT WAIT displays when the tube anode is cooling. No exposures can be taken while this message appears. (The length of the delay will vary with the selected technique.) If an exposure is attempted while HEAT WAIT is active X-RAY DISABLED will be displayed.
   - The kVp/mAs Numeric Display will flash for about 6 seconds after the release of the hand switch from the PREP position, if an exposure has occurred.
10. Secure the unit for transport when the exam is complete.
11. Park tube and detector.

Technique Adjustment

The software provided with the GE Portable DR Detector contains the recommended default technique settings for both digital and cassette exams. Technique adjustment should **always** be made on the Acquisition screen. Refer to Appendix A: GE Portable DR Detector Operating Instructions-Chapter A4: Image Acquisition for more information.

The mAs and kVp adjustment buttons provided on the display panel should only be used if the unit software fails. The following information is provided for reference if the software fails and techniques must be adjusted manually.

IMPORTANT!: If the software fails, the digital detector cannot be used; exams must be taken with either an analog or CR cassette.

When in acquisition mode, the display panel also shows the kVp and mAs values (Figure 5-1). Changing the values on the control panel automatically updates the values on the Acquisition screen and vice versa.

Figure 5-1 kVp and mAs display on unit and Acquisition screen

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Use the kV and mAs fields on the Acquisition screen or the up and down arrow buttons on the control panel (Figure 5-2) to adjust the parameters for a patient exam.

Figure 5-2 Technique adjustment buttons

1. To increase the kVp, press the UP kVp arrow. To decrease the kVp value, press the DOWN kVp arrow. See Figure 5-2.
2. To increase the mAs, press the UP mAs arrow. Press the DOWN mAs arrow to decrease the value.
   - Should you reach a maximum or minimum value, kVp / mAs MAX or kVp / mAs MIN will briefly appear on the message display to alert you.

IMPORTANT!: Carefully check the digital display (Figure 5-1) before making an exposure to ensure that the factors selected are those that are intended. Pay particular attention to the placement of the decimal point in the mAs setting to ensure that whole numbers are not mistaken for an intended mAs fractional number.

- The kVp ranges from 50 to 125 kVp, in 24 steps:
  - 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 80, 85, 90, 95, 100, 105, 110, 115, 120 and 125.
- The mAs ranges from 0.40 to 320 mAs, in 30 steps:
  - 0.4, 0.5, 0.64, 0.8, 1, 1.25, 1.6, 2, 2.5, 3.2, 4, 5, 6.40, 8, 10, 12.5, 16, 20, 25, 32, 40, 50, 64, 80, 100, 125, 160, 200, 250 and 320. Refer to Table 5-1 for maximum technique ratings.

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Table 5-1 Maximum kVp and mAs Ratings

kVp	mAs
110 to 125	200
95 to 105	250
50 to 90	320

- It is important to note that the kVp setting takes precedence over your mAs setting. That is, if your technique would generate too much heat for the x-ray tube anode, the mAs setting will automatically decrease to permit the selected kVp.
  - For instance, if kVp is set at 110 then your maximum mAs will not exceed 200.

NOTE: The maximum allowable kVp and mAs ratings stated within this operation manual and as allowed by the equipment, may appear to exceed the tube ratings. The reason for this apparent discrepancy is that the tube rating charts in Product Data Sheet 2236721-100 are based upon a 25% heated tube assembly (75% heat units remaining), while the actual maximum allowable kVp and mAs ratings are based upon a cold tube assembly. The Definium AMX 700 generator contains a proprietary heat loading algorithm which protects the tube assembly for all heat loading conditions.

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Chapter 6: Charging the Batteries

Topics covered include:

- Overview (p. 6-1)
- Standby Mode (p. 6-2)
- Recharge Recommended (p. 6-3)
- Battery Drain (p. 6-3)
- Application Tip (p. 6-4)
- How to Re-Charge Batteries (p. 6-4)
- Main Power Circuit Breaker (p. 6-6)

Overview

Battery charging is as easy as driving the Definium AMX 700 to a correctly rated wall outlet and plugging the unit in. Ratings are as follows:

Table 6-1 Wall socket rating by model number

Models	Rating
5151481-3 5151481-4	110/125 Volts AC, 50/60 Hz @ 5A

The time required to fully recharge the Definium AMX 700 batteries will vary according to battery charge level as indicated on the battery status display.

During recharge the Definium AMX 700 capacity gauge increases as the unit is charged. To recharge from 10% to 100% typically requires 4-5 hours.

Occasionally the Definium AMX 700 automatically performs an extended charge to make sure that all portions of the battery's internal plates get fully charged. This extended charge occurs every tenth 10th) time the battery is charged.

To recharge from 10% to 100% during an extended charge typically requires 10 hours. The Definium AMX 700 will continue to attempt extended charges until at least half of the extended charge time is complete.

NOTE: The extended charge will be transparent to the operator. The only indication that it is in progress is the longer charge time.

Although portable application will vary site to site, under most operating conditions, a fully charged Definium AMX 700 is designed to supply enough charge for 2 hours of use.

The Definium AMX 700 capacity gauge visually displays the remaining capacity using a 48 segment bar graph display.

At or near full charge, all segments are illuminated (Figure 6-1).

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The blue battery status display approximates remaining battery charge, and should only be used to determine the relative state of charge.

Figure 6-1 Charging display

Charging

Full charge

Capacity Gauge Features

"Stuck at Full" Feature

After the Definium AMX 700 charges to 100% (i.e. "CHARGE COMPLETE"), the capacity gauge will remain "stuck-at-full" for a pre-programmed amount of usage before the number of lit segments begins to decrease. This usage is equivalent to approximately 10 minutes of drive or 25 minutes of idle. Once this "stuck-at-full" capacity is used, the capacity gauge will update according to Table 6-2.

Emergency Capacity Feature

When the Definium AMX 700 capacity gauge drops to 0%, inhibiting x-ray exposures, it is possible to access some emergency capacity to finish an exam by turning the Definium AMX 700 off and then back on. After it has completed its power-up tests, the Definium AMX 700 will provide enough capacity for approximately 45 seconds of usage before x-ray exposures are again inhibited.

CAUTION: **In some cases the Definium AMX 700 battery may not provide sufficient voltage for proper operation when EMERGENCY CAPACITY is used. Therefore this feature should only be used when absolutely necessary.**

Standby Mode

Having the key switch ON while charging will result in standby mode. Drive and exposures are not allowed, but the PC and monitor can be used. The unit will remain in standby mode for a maximum of 60 minutes. There will be a timer countdown in the display area showing the remaining time before the PC and monitor will be turned off. After the PC and monitor is turned off, the display will show "TURN OFF SWITCH".

It is highly recommended to always turn the unit off while charging.

NOTE: The unit will not fully charge in the normal 4-5 hours if kept in standby mode.

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Recharge Recommended

When battery charge dips below approximately 10%, recharge is recommended.

As the Definium AMX 700 is used in its various modes of operation, the number of segments lit will slowly decrease.

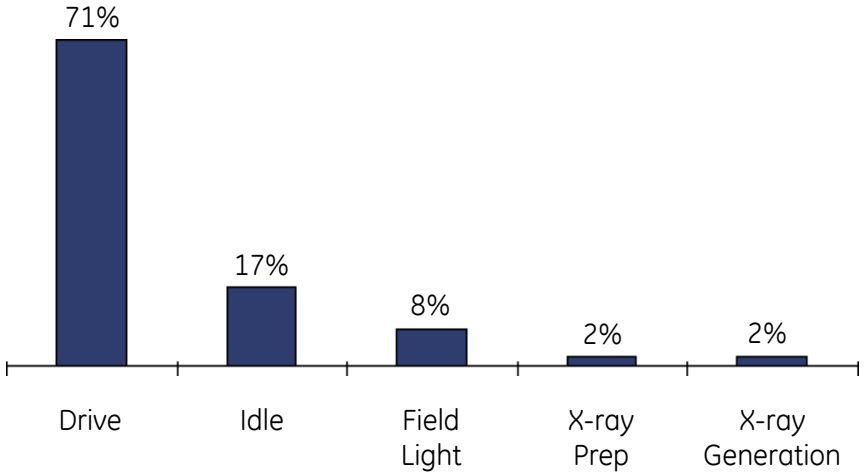
It's important to note that you do not have to raise your kVp and mAs value to compensate for low battery capacity.

To ensure maximum battery life, the Definium AMX 700 should not be recharged until at least one-half of the bar graph segments have extinguished.

Battery Drain

Figure 6-2 shows how much of the battery capacity is used for the various Definium AMX 700 operating modes in a relative basis.

Figure 6-2 Battery drain



As Figure 6-2 demonstrates, the majority of the battery pack's capacity is used for drive and idle. Thus, reducing the amount of drive time by parking the Definium AMX 700 in a central location and turning the system OFF when not in use will make more capacity available for x-ray generation and will increase the service life of the batteries.

Bar Graph Display vs. Battery Loading

Table 6-2 details the various battery loads and how they affect the bar graph display.

Table 6-2 Battery loads

Load mode	Approximate discharge rate	Typical daily usage*
Drive (Drive handle engaged)	0.45 segments/minute	30 segments

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Load mode	Approximate discharge rate	Typical daily usage*
Idle (Definium AMX 700 on but not in use)	0.14 segments/minute	7 segments
Field Light (Any time light is ON)	0.39 segments/minute	4 segments
X-Ray Prep (PREP switch depressed)	0.45 segments/minute	1 segment
X-Ray (High voltage generation)	0.0005 to 0.8 segments/ exposure	<1 segment
TOTAL DAILY SEGMENTS TURNED OFF:		43 segments (90%)

* Typical daily usage is based on historical data from AMX4+ sites and estimated Definium AMX 700 usage for typical mobile radiography procedures. Note that actual loading will vary from site to site depending on usage.

Application Tip

To insure the greatest reliability, you may decide to establish a battery charging schedule at your particular site, based on past experience and anticipated needs.

How to Re-Charge Batteries

Follow these steps to recharge the batteries.

CAUTION: When recharging the batteries, always locate the unit in a well ventilated area.

1. Drive the Definium AMX 700 to a designated battery charging station or to a correctly rated wall outlet. Position the unit to within 10 feet of the outlet.
2. To plug in, firmly grip the plug located on the front of the unit (Figure 6-3), and pull the retractable cord straight out until it is fully extended. Set the cord by a slow pull-release action. Plug into the battery charging station.

Figure 6-3 Battery charging cord

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3. Check the message display to confirm the charging status: the message CHARGING should appear on the display (Figure 6-4).
   - The message "STANDBY XX MINS" will appear if the Key Switch is ON. Refer to Standby Mode (p. 6-2) for more information.

Figure 6-4 Charging display

   - During normal charging all other controls—driving and x-ray exposures, for instance—are disabled. Note that you may charge the batteries with the Key Switch in either the ON or OFF position.
   - During STANDBY (refer to Standby Mode (p. 6-2) for more information), the unit may not be driven nor may x-ray exposures be taken. If the Key Switch is in the ON position and the display shows STANDBY, the system software may be used to update Worklist data, view and adjust images stored in the local database, manage images, or edit preferences. Normal QAP tests cannot be performed. The unit will remain in standby mode for a maximum of 60 minutes.

4. When CHARGE COMPLETE appears on the message display, and all blue segments are illuminated, the batteries are fully charged (at 100% of capacity).
   - Charging should not be stopped before the CHARGE COMPLETE message appears, even if all of the indicator bars are illuminated.

5. Unplug the unit from the outlet, giving the plug a slight tug to release from take-up reel.

IMPORTANT!: After unplugging the unit, turn the unit on and wait approximately 15 minutes before taking your first exposure to ensure technique accuracy.

- If the unit is plugged into the AC wall outlet for an extended period after the "Charge Complete" message is displayed, the unit will shutdown by tripping the main circuit breaker to protect the internal electronics. This same protection scheme can cause the main circuit breaker to trip if the Definium AMX 700 is turned on while still plugged into the AC wall outlet after the "Charge Complete" message is displayed (there may be a delay of 30 - 180 seconds after the unit is turned on before the breaker will trip). Refer to Main Power Circuit Breaker (p. 6-6) for more information.

IMPORTANT!: The unit should be unplugged when the "Charge Complete" state is reached. Also, the Key Switch should not be turned ON while the unit is plugged into the AC wall outlet while the "Charge Complete" message is displayed.

- The prompt BATTERY TOO HIGH may display when the first exposure is attempted after charging. If this occurs, run the rotor for 15 to 20 seconds and then make the exposure. This prompt is caused by a normal battery voltage rise after charging.

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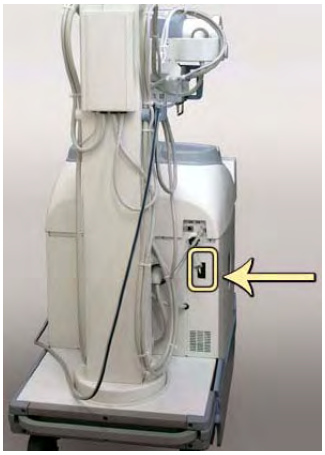
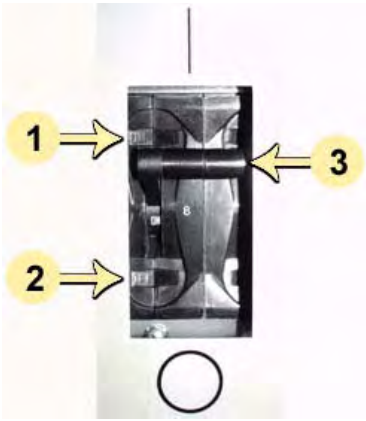
Main Power Circuit Breaker

The main power circuit breaker is located on the front right side of the unit (Figure 6-5).

Figure 6-5 Main power circuit breaker





1. ON position
2. OFF position
3. Trip lever

If the battery charge is too low, or in the event of an overload in the high-voltage system, the circuit breaker will trip (interrupt power to the x-ray unit).

Should the circuit breaker trip, the control panel lights will go out and you will be pre vented from operating the unit. To resume operation, flip the circuit breaker up to the ON position. If necessary, recharge the unit or (if the battery is adequately charged) try the procedure again.

If the battery is within operating condition (as indicated by the battery status and message displays) and power interruptions are frequent, there may be a fault in the high voltage system. If a fault is indicated, have the unit checked by a qualified service representative.

If the unit does not turn off when the key switch is turned off, isolate the unit to prevent unauthorized operation, use the circuit breaker to remove power from the unit, and have the unit checked by a qualified service representative.

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Chapter 7: Maintenance and Service

Topics covered include:

- Cleaning the Unit (p. 7-1)
- Periodic Maintenance by Service Personnel (p. 7-1)
  - Qualified Service Available (p. 7-2)
  - Maintenance Schedule (p. 7-2)

Cleaning the Unit

We recommend that you clean the Definium AMX 700 regularly with a soft cloth and a mild, non-abrasive cleaner. Apply the cleaner to the cloth, not directly to the unit, to safe-guard against damage to the circuitry. If a corrosive chemical is spilled or splashed on the unit surface, be sure to clean it off immediately.

The following chemicals and products have been tested and approved by GE for cleaning the Definium AMX 700 and GE Portable DR Detector.

- Cidex OPA
- Gigasept FF
- T-Spray
- Inciden Plus
- Perasafe
- Ster-Bac Blue
- Super Sani-Cloth Germicidal Wipes
- TriGene
- Isopropyl Alcohol (70% maximum solution)
- Bleach (50% solution)

Refer to Chapter A1: Detector Overview-Cleaning (p. A1-10) for more information about cleaning the GE Portable DR Detector and its accessories.

Periodic Maintenance by Service Personnel

To insure the continued safe performance of your Definium AMX 700 portable x-ray unit, establish a periodic maintenance program with a qualified service representative.

Periodic maintenance checks are required thirteen months after installation and every year thereafter. A periodic maintenance schedule and a sample mAs or kVp accuracy chart are provided on the following pages.

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Qualified Service Available

GE Healthcare and its associates maintain a worldwide organization of service personnel specially trained on medical x-ray equipment. Consult your GE representative to find out more about all the available service programs.

Maintenance Schedule

Table 7-1 Periodic Maintenance Schedule

Maintenance/Checks	Frequency
Replace counterweight cable	Every 5 years
Inspect counterweight cable	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Verify no movement between collimator and tube unit	Every 12 months, verify that there is no movement between the collimator and X-ray tube. If any movement is detected, you MUST remove the collimator and inspect all related fasteners. Refer to Service Documentation CD-ROM 5161519-200 for additional information.
Extension arm inspection	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Collimator general inspection and adjustment	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Filament and rotor interlocks	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
X-ray tube anode rotation	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Column and carriage assembly inspection	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
mAs accuracy	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
kVp accuracy	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Operator displays	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Cross hair	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Collimator alignment	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Field size indicator	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Rotational detent	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Verify all cable ties are tight and secure	Every year (Refer to Service Documentation CD-ROM 5161519-200.)

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Maintenance/Checks	Frequency
Check that Detector Power Supply cables and cable retention clips are securely in place	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Exposure tone is audible and x-ray on indicators light up when hand switch depressed to expose position	Every year (Refer to Service Documentation CD-ROM 5161519-200.)
Auxiliary items (battery charger, HV cables, etc.)	Every year (Refer to GE Portable DR Detector PM Schedule.)
Detector calibration	Every year (Refer to GE Portable DR Detector PM Schedule.)
Visual inspection of detector, tether and grid for damage, wear, etc.	Every year (Refer to GE Portable DR Detector PM Schedule.)
Inspect PC shock mounts for damage/wear	Every year (Refer to GE Portable DR Detector PM Schedule.)
Verify the PC is still mounted securely.	Every year (Refer to GE Portable DR Detector PM Schedule.)
Inspect monitor for damage/ wear	Every year (Refer to GE Portable DR Detector PM Schedule.)
Check that the monitor is tightly bolted to the top cover.	Every year (Refer to GE Portable DR Detector PM Schedule.)
Monitor calibration	Every year (Refer to GE Portable DR Detector PM Schedule.)
Touch screen calibration	Every year (Refer to GE Portable DR Detector PM Schedule.)
Equipment and Serial Number:	
Date of Inspection:	
Maintenance Check Performed By:	

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Table 7-2 Sample chart for technique accuracy tests

Technique Selected				
mAs	kVp	Primary Volts	kVp	Time (Sec.)

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Chapter 8: Messages on Display

Two kinds of messages can appear on the message display on the control cover: status messages and error messages.

Status messages simply inform you of the operating condition of the Definium AMX 700, and look something like this.

Figure 8-1 Ready message

Another type of message, called an error message, may appear should a problem occur with the equipment. An error message looks something like this.

Figure 8-2 Error message

Note that an error message includes an alphanumeric code, and will display one line at a time.

If an error message appears, follow these steps.

1. Try the function again. If the problem is corrected, and no error message is displayed, proceed as usual.
2. If the error message still displays, turn the unit OFF then back ON.
   - Diagnostics or self-tests are quickly performed when the unit is turned back on.
   - When diagnostics are complete, the following message displays:

     ERROR XXX
     OCCURRED WHEN
     THE UNIT WAS
     LAST OPERATED –
     PROCEED WITH
     ---CAUTION –
3. Now try the function once more. If the problem is corrected, and no error message is displayed, proceed as usual.
4. If the problem persists, call your service representative, and report the code and message shown on the display. This will prepare service for the type of problem encountered and the service required.

Table 8-1 lists the status messages and provides a brief explanation of each one.

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Table 8-1 Status message descriptions

Status Messages	Description
AUTO CAL LIMIT	If this message displays, the unit is at its automatic calibration limit. A service call is recommended to ensure accurate technique and radiographic results. Exposures are not inhibited.
BATTERY TOO HIGH VOLTAGE RECOVERY IS REQUIRED	This message may appear when attempting to take a high technique exposure immediately after removing the unit from charge. Exposure is prevented. Operating the field lamp or driving theDefinium AMX 700 will assist in stabilizing the battery voltage so that the exposure may be made.
BATTERY TOO LOW	This message may appear when attempting to expose when only a few segments remain on the battery charge indicator. This means that the battery does not contain sufficient charge to make an exposure.
CHARGE REQUIRED	Exposure is prevented. Recharging the batteries will eliminate the message and allow exposures.
CHARGE COMPLETE	The charge process is complete, and the battery is fully recharged.
STANDBY	The unit is allowing usage for a maximum of 60 minutes (keyswitch is ON and the unit is plugged in).
CHARGING	The unit is charging.
DRIVES ONLY	All modes are disabled except drive. Service is required.
HEAT WAIT	No exposures can be taken while this message appears (The length of the delay will vary with the selected technique). This message displays while the tube anode is cooling.
kVp MAX	Displayed on the alphanumeric display any time an attempt is made to increase the kVp above125.
kVp MIN	Displayed on the alphanumeric display any time an attempt is made to decrease the kVp below 50.
LIGHT DISABLED FOR COOLING	If the field light is on for over 4 minutes, the light will be automatically turned off to prevent the collimator from overheating. You may activate the field light in about 5 minutes.
mAs MAX	Displayed on the alphanumeric display any time an attempt is made to increase the mAs above320 or above the acceptable energy limit for the x-ray tube anode. The acceptable heat limit is based on the kVp you selected. Note that the kVp setting will always take precedence over the mAs setting. That is, if the technique selected would generate too much x-ray tube heat, the maximum mAs will automatically decrease to permit the selected kVp.
mAs MIN	Displayed on the alphanumeric display any time an attempt is made to decrease the mAs below 0.40.

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Status Messages	Description
READY FOR X-RAY	The prep cycle has successfully completed, and an exposure may be taken within the next 30 seconds. (If an exposure is attempted after 30 seconds, the prep cycle must be repeated.)
RECHARGE IMMEDIATELY X-RAY INHIBITED	The estimated usable battery capacity is near 0%. No more exposures may be taken. Although charge is too low to complete an x-ray exam, you'll have enough energy to drive the unit to a correctly rated wall outlet for recharge.
RECHARGE RECOMMENDED	The remaining battery capacity is approximately 10% or less.
RELEASE HANDLE	The Definium AMX 700 was moving faster than the drive motors allow. Release the Drive Handle to clear the message, and then continue with normal operation. This may happen if you push the Definium AMX 700 too hard when driving down a ramp.
RELEASE PREP SW	The prep switch is still depressed (five seconds after an exposure or beyond the 30-second timeout). If taking an exposure, repeat the prep cycle: 1) release the prep switch, and 2) when the message WAIT is no longer displayed, press to prep position again.
RESET AEC CNTROL	Reset the AEC controller. AEC is on, but not enabled. For Example: The (ON) light is flashing on the Automatic Exposure Control (AEC) unit. This indicates the paddle is not connected. Reset the AEC controller. The red reset (GEN) on the Automatic Exposure Control (AEC) unit is lit. This indicates the back-up time is too short. Reset the AEC controller.
REVERSE ONLY	Forward drive is prevented because the safety bumper is in contact with another object. Reverse the unit before proceeding.
TESTING COMPLETE	Power-up diagnostic testing is finished.
WAIT	Wait before taking another exposure. (Displayed when the tube anode has cooled, but before the battery has recovered from the previous exposure.) Although radiographs can be taken, because of low battery voltage they may not achieve the desired kVp technique accuracy.
WAIT/ACT-XX.X	After an AEC exposure the XX.X field will display the actual exposure mAs.
X-RAY DISABLED	This message appears if an attempt to make an exposure occurs while HEATWAIT is displayed.
X-RAY TUBE PARKED	No exposures can be taken with the x-ray tube in the park/transport position.
DETECTOR PARKED	Detector is in the holder. Exposures are inhibited
DIGITAL MODE	System Software is ready for Digital Radiography procedures
FILM MODE ONLY	System can only be used for film procedures

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Status Messages	Description
NO DIG, FILM ONLY	System malfunction and can only be used for film procedures
WAIT FOR DIGITAL	System software is being loaded. Wait for system to boot completely.
SHUTTING DOWN	System PC is shutting down
GOOD-BYE	System PC has shut down
NO DIG RESPONSE	Digital Radiography components are not responding.
TURN OFF SWITCH	System PC has shut down. Turn Off the unit using the Key Switch

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Appendix A: GE Portable DR Detector Operating Instructions

This appendix details all the software that is provided with the GE Portable DR Detector used with the Definium AMX 700.

Topics covered in this appendix include:

- Chapter A1: Detector Overview describes the detector functions, handling, and use.
- Chapter A2: General Information describes features and functions that apply to the whole detector and detector software.
- Chapter A3: Worklist describes the process of adding procedures to and selecting procedures from the Worklist screen to begin exams.
- Chapter A4: Image Acquisition describes the process of performing exams.
- Chapter A5: Image Viewer describes the features and functions for adjusting and viewing acquired images.
- Chapter A6: Image Management describes the features and functions to find and organize acquired images and exams.
- Chapter A7: Set Preferences describes the features and processes to configure the detector software.
- Chapter A8: Quality Assurance Process and Maintenance describes the process to conduct checks on the detector for continued image quality.

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Chapter A1: Detector Overview

This section outlines the basic detector functions, usage, care, and specifications.

Topics covered include:

- Detector Functions (p. A1-2)
- Description (p. A1-2)
  - Panel (p. A1-3)
  - Electronics (p. A1-3)
  - Physical Appearance / Finish (p. A1-3)
  - Nameplates and Markings (p. A1-3)
  - Detector Safety Labels (p. A1-4)
- Use (p. A1-5)
  - Detector Alignment (p. A1-5)
  - Indicator LEDs (p. A1-5)
  - Electro-magnetic Interference (p. A1-6)
- Detector Grid (p. A1-7)
  - Grid Attachment (p. A1-7)
- Handling and Cleaning (p. A1-8)
  - Detector Handling (p. A1-8)
  - Tether Handling (p. A1-9)
  - Grid Handling (p. A1-9)
  - Cleaning (p. A1-10)
- Specifications (p. A1-11)
  - Detector Size and Weight (p. A1-11)
  - Environmental Constraints (p. A1-11)

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Detector Functions

Detector primary functions are:

- To convert x-ray data into digital image data
- To transfer the digital data to an external workstation for processing and display

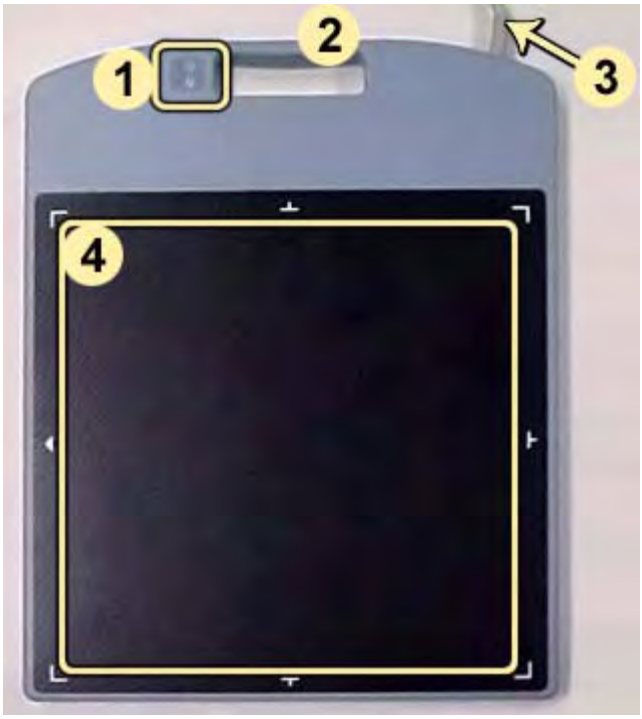
Description

The detector is an x-ray imaging device. It consists of an array of 2022 x 2022 pixels (40.4 x 40.4 cm). Each pixel is attached to a data acquisition circuit that converts incoming x-ray signal to 14-bit digital data.

The detector is constructed from a metal case. The front face contains a graphite x-ray imaging window. The back face contains the usage instructions and safety warnings.

Figure A1-1 shows the front of the detector, which faces toward the x-ray source.

Figure A1-1 Detector front



1. LED indicator lights
2. Handle
3. Tether
4. Detection area (inside white marker lines)

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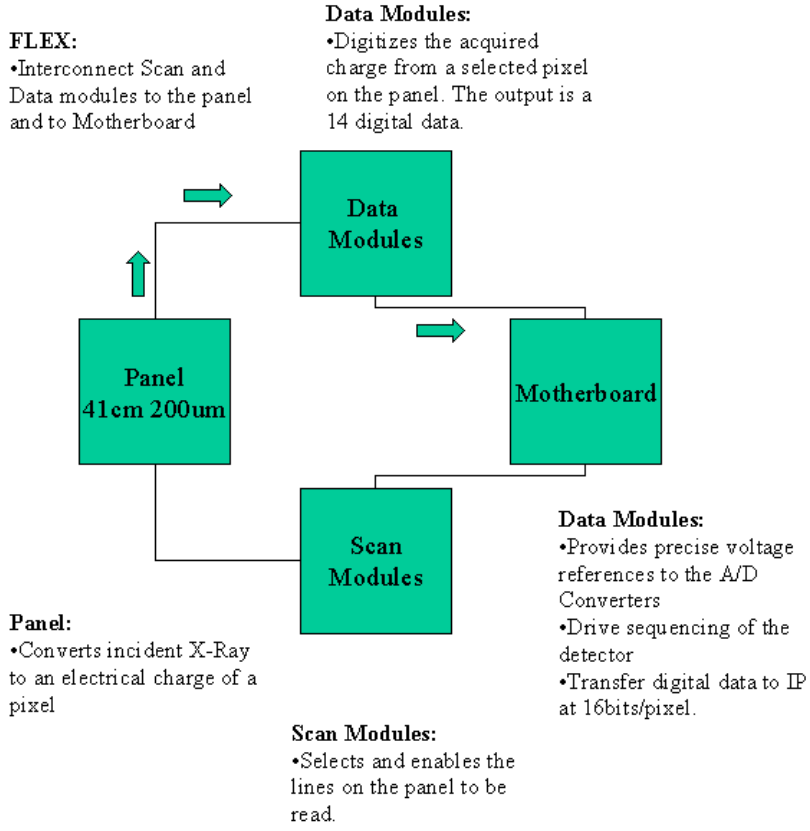
Figure A1-2 Detector operation diagram


FLEX:
•Interconnect Scan and Data modules to the panel and to Motherboard
Data Modules:
•Digitizes the acquired charge from a selected pixel on the panel. The output is a 14 digital data.
Data Modules
Panel 41cm 200um
Motherboard
Scan Modules
Data Modules:
•Provides precise voltage references to the A/D Converters
•Drive sequencing of the detector
•Transfer digital data to IP at 16bits/pixel.
Panel:
•Converts incident X-Ray to an electrical charge of a pixel
Scan Modules:
•Selects and enables the lines on the panel to be read.

Panel

The panel consists of a thin-film amorphous silicon integrated circuit on a glass substrate with a cesium iodide scintillator. The scintillating material absorbs the x-rays and converts the energy to light. The light is converted into a charge that is digitized by the detector electronics.

Electronics

The primary function of the readout electronics is to convert the charge into digital image data. This data is then transmitted to the system workstation through an ethernet connection.

Physical Appearance / Finish

The detector unit is designed to be installable as 1) an external patient access/contact surface and 2) a non-external patient access/contact surface.

Detector surfaces have been treated with a finish to allow a smooth and easily cleanable surface. Care shall be taken to protect the surface from scratches.

Nameplates and Markings

A label on the back of the detector contains the GE part number.

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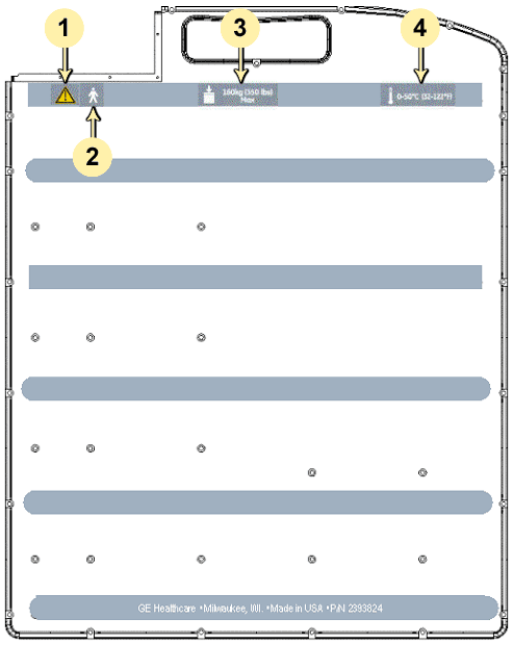
Detector Safety Labels

The back of the GE Portable DR Detector displays the following symbols and information:

Figure A1-3 Labels on back of detector



1. Attention, consult accompanying documents.

CAUTION: Do Not Drop.

CAUTION: Device weighs 5.89kg (13 lbs).

CAUTION: Do Not Use a defibrillator while patient remains in contact with detector.

2.Type B Applied Part

3. Maximum load

CAUTION: Maximum load is 160 kg (350 lbs).

4. Operating temperature

CAUTION: Operate and store the detector within the temperature range of 0 – 50° C (32 -122°F).

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Use

Detector Alignment

To aid in proper alignment of the detector with respect to the X-ray source, there are alignment marks centered on the front side (imaging side) of the detector. The arrow represents the default heads-up display orientation.

Indicator LEDs

Two LEDs have been provided for indication of the detector status.

- The red LED lights up when the detector patient contact temperature is below 0°C (32°F) or if the temperature exceeds 50°C (122°F).
- The green LED lights up when the detector is powered, and has performed at least 4 scrubs. This LED indicates “Ready to Image” status.

Table A1-1 shows a list of conditions and how they are communicated by the LED lights.

Table A1-1 Detector status lights

Condition	Green LED		Red LED		Indication
Detector Off	Off	Off	Off	Off	Detector Off or No Power
Idle Mode	50%	1s	Off	Off	Idle Mode
Ready to Image	100%	-	Off	Off	Ready for X-ray
Temperature Warning	-	-	50%	1s	Contact Temp exceed warning
Temperature Error	-	-	100%	-	Contact Temp exceed safe level
Diagnostic Failure	Off	Off	50%	2s	Failure in BIST
Timeout Error	Off	Off	50%	.5s	No power mode command in time
Diagnostic Running	75%	1s	Off	Off	Test Running
Image Transfer	50%	.1s	Off	Off	Active data transfer
Lost Communication	50%	1s	50%	1s	No communication with the system

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Electro-magnetic Interference

The detector has been designed and tested to meet all IEC regulations in regard to electro-magnetic (EM) susceptibility (and EMC).

However, there are no regulations for low frequency EM fields. All flat panel detectors have some susceptibility to these EM fields.

This detector is robust to EM fields up to 0.1mG over a broad low frequency range (DC - 250kHz).

It has been found that some common equipment in clinical environments can generate EM fields well over 0.1mG. Some measurements have shown 4mG field strengths which can cause artifacts on x-ray images.

EM fields are reduced by the square of the distance between the EM source and the detector. Thus, moving the EM source twice as far away will reduce the field strength by 4 times.

General suggestions:

- Keep IV pumps, patient monitoring, feeding pumps 1 meter or more away from any detector surface.
- Consider turning off equipment that cannot be moved.
- Change the patient or detector orientation /position to maximize distance from any equipment.

Possible sources of EM fields:

- IV pumps
- Monitors
- Feeding pumps
- Patient monitors
- ECG equipment
- EMG equipment
- Infusion pumps
- RF ablators
- Powered surgical equipment
- Heaters
- Air conditioners
- Refrigerators

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Detector Grid

The GE Portable DR Detector grid is integrated with a holder that fits the detector exactly. The grid fits over the detector handle and has raised edges to fit around the detector. Once together, you may handle the grid and detector as one unit.

The arrows on the grid surface show the direction of the grid lines. As shown in Figure A1-4, they grid lines run horizontally.

Figure A1-4 Grid

Place the grid over the detector so that the detector LED lights show through the holes in the grid holder.

Grid Attachment

The bottom edge of the detector should be placed into the bottom lip of the grid holder while held in the vertical position with the carbon graphite cover (on the front of the detector) facing the inside of the grid holder. Then press the detector into the top edge of the grid holder. Be careful to not pinch your fingers or clothing when assembling.

While in use, keep a firm grasp on both the grid holder and the detector. The markings for the active area are clearly shown on the exterior surface of the grid holder.

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Handling and Cleaning

Detector Handling

The device contains sensitive electronics that are susceptible to vibration, shock, drop, and impact.

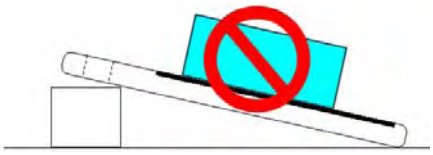
When handling the device, use the handle and/or use both hands to manipulate the detector into the correct anatomical position for the exam.

WARNING: Do not swing the device into hard surfaces, especially corners, as this may scratch the cover, create an image quality artifacts, or damage the electronics inside.

Special Instructions if the detector is dropped: Inspect the exterior for any possible cracks. Run Detector Check to test the detector (refer to Chapter A8: Quality Assurance Process and Maintenance). It will be clear if the electronics are not functioning. Other possible failures may include communication problems, image quality degradation, and loss of power. If any or all of these occur, call your GE Service Representative.

- Do not drop objects onto the detector.
- Do not use the detector as a stretcher to lift a patient.
- Do not drop the detector at any time.
- Do not prop the device on an edge, against wall or bed. Keep detector in cradle, bucky, or other GE-supplied container.
- Do not place other objects or patients on the detector if it is not on a flat surface, as shown in Figure A1-5.
- Do not use unapproved chemical cleaners.
- Do not immerse detector into water or other liquids.
- Do not use a defibrillator while patient remains in contact with detector.

Figure A1-5 Detector handling - do not place objects on detector if it is not lying flat



Detector surfaces have been treated with a finish to provide a smooth and easily cleanable surface. Take care to protect the surface from scratches.

WARNING: Extra precautions should be taken if the device will be exposed to excessive amounts of bodily fluids or liquids.

The detector is designed to prevent some liquids or particulate matter from getting inside the cover. It can sustain a temporary splash or spray, but it is not designed to be immersed in liquid (not even temporarily).

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Tether Handling

The tether connects the detector to the system. Damage to the tether means that the detector cannot send image data to the unit.

To ensure maximum tether life, follow these guidelines:

- Treat the tether with care.
- Clean the tether regular with an approved chemical. Refer to Cleaning (p. A1-10) for more information.
- Untwist the tether periodically. The colored stripe on the tether shows if it is twisted.
- Do not jerk or pull on the tether. For example, do not pull on the tether to free it from under a wheel (especially if the tether is twisted).
- Do not step on the tether.
- Do not run over the tether with the unit, cart, table or other equipment.
- Do not use the tether as a handle.
- Do not bend or fold the tether sharply, especially at the points where the tether connects to the detector and to the unit.

Grid Handling

The grid is a sensitive device containing delicate mechanical structures. It is made of very thin pieces of lead (Pb) and interspersed with Aluminum (Al).

- Do not drop the grid.
- Do not allow objects to hit/impact the grid.
- Do not immerse grid in water or other liquid.
- Do not peel labels or vinyl covering.
- Inspect the grid for physical damage before use.
- Clean the grid regularly (between each patient) with an approved chemical. Refer to Cleaning (p. A1-10) for more information.

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Cleaning

All exterior surfaces—detector, tether, and grid—should be cleaned after each exam.

- The detector and grid must be allowed to dry before use.
- Do not leave disposable wipes or cleaning cloths on the detector or grid for more than 60 seconds.
- Let the detector dry at least 60 seconds between cleanings.

The following chemicals and products have been tested and approved by GE for cleaning the GE Portable DR Detector, grid, and tether.

- Cidex OPA
- Gigasept FF
- T-Spray
- Inciden Plus
- Perasafe
- Ster-Bac Blue
- Super Sani-Cloth Germicidal Wipes
- TriGene
- Isopropyl Alcohol (70% maximum solution)
- Bleach (50% solution)

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Specifications

Detector Size and Weight

Table A1-2 Detector size and weight specifications

Item	Specification
Overall detector size • Including handle • Not including tether	Thickness: 27mm Width:465mm Height:585mm
Image Size The active area of the x-ray panel	2022 x 2022 pixels or 40.4 x 40.4 cm
Weight Not including the tether or grid	6 kg
Tether The detector interfaces with the external controller via one tether cable that contains 2 connections, communication interface (with external controller), and power interface (with detector power supply)	The tether is at least 4.5 meters in length.

Environmental Constraints

Table A1-3 describes the environmental conditions that the detector is designed to withstand.

CAUTION: Operation or storage outside of these constraints may cause damage to the detector.

Table A1-3 Environmental Constraints

Item	Operating Environment Constraints	Non Operating Environment Constraints
	This column contains additional operating environmental constraints, within which the subsystem function and performance capabilities shall be in compliance.	This column defines additional Non-operating environmental constraints, within which the subsystem function and performance capabilities shall be in compliance, when returned to the operational state, within operating environment conditions.

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Item	Operating Environment Constraints	Non Operating Environment Constraints
Ambient • Temperature • Humidity • Pressure	• External ambient temperature range: +10 ºC to +30 ºC. • Rate of temperature change: 10 ºC per hour • Ambient humidity range: 10% to 80%, non condensing. • Rate of humidity change: 30% per hour. • Atmospheric pressure (altitude) range: -400 meters to +3000 meters relative to sea level.	• External ambient temperature range: 0ºC to +50 ºC. • Rate of temperature change: 20 ºC per hour • Ambient humidity range: 5% to 95%, non condensing. • Rate of humidity change: 30% per hour. • Atmospheric pressure (altitude) range: -100 meters to +15,000 meters relative to sea level (to support pressurized transport)
Mechanical Stress & Vibration Forces	The detector assembly shall not be exposed to operating vibration spectrum exceeding the following parameters: • Type: Random • Frequency Range: 20 to 350 Hz • Magnitude: 0.006g2 /Hz at 10-350 Hz • Duration: 8 hours/axis (x, y, z)	The detector assembly shall not be exposed to non-operating vibration spectrum exceeding the following parameters: • Type: Random • Frequency Range: 10 to 2000 Hz • Magnitude: 6 m/s2 RMS or 0.02g2 /Hz at 10-2000 Hz • Duration: 15 minutes/axis (x, y, z)
Shipping & Storage Environment	Not applicable.	The non-operating shipping conditions shall be -20 to +60 with the detector and packing. The shipping container shall protect the detector from vibration of 2 Grms for 8 hours in the x, y, and z axes, random vibration from 10 to 2000 Hz such that the image quality is not degraded. Cargo hold during shipment shall be within the atmospheric pressure range of 700-1100hPa

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Chapter A2: General Information

This chapter explains some of the basic operations and features of the system such as how to start up and shutdown the system software, how to login and log off, and how to view system status and messages.

Topics covered include:

- Virtual Keyboard (p. A2-2) (mobile systems)
  - International Language Configuration (p. A2-3)
- Software Start Up and Shutdown (p. A2-4)
  - Start Up (p. A2-4)
  - Shutdown (p. A2-4)
- Login and Log off (p. A2-5)
  - Invalid Password Message (p. A2-6)
  - Emergency Login (p. A2-6)
  - Inactivity Timeout (p. A2-7)
  - Log Off (p. A2-7)
- Wireless Network Connection (p. A2-7) (mobile systems)
  - Software Reset (p. A2-8)
- System Reset (p. A2-9)
- Lead Markers (p. A2-9)
- System Status and Messages (p. A2-10)
  - Expose Hold (p. A2-10)
  - System Status Area (p. A2-10)
  - Message Log (p. A2-11)

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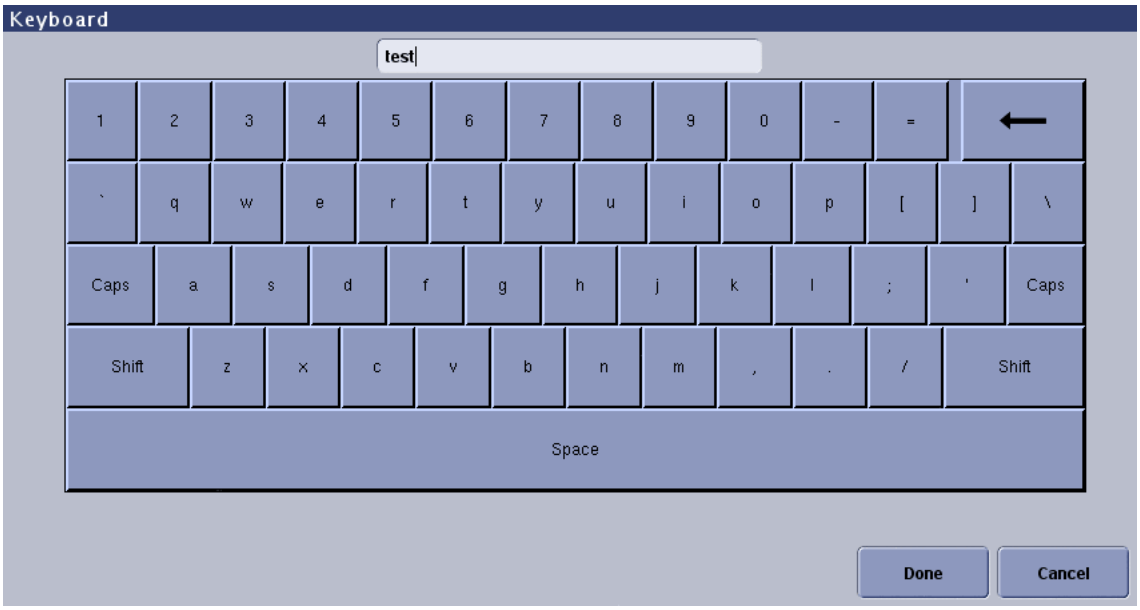
Virtual Keyboard

When used in a mobile system, the GE Portable DR Detector software works with a touch screen instead of a keyboard and mouse. The GE Portable DR Detector provides a “virtual keyboard” on screen that allows you to enter text and numbers.

The virtual keyboard (Figure A2-1) automatically appears on screen whenever you touch a text box or the [KEYBOARD] button.

Figure A2-1 Virtual keyboard



The virtual keyboard functions like a typewriter or computer keyboard, but instead of pushing actual keys, you press the corresponding buttons on screen to make letters and numbers appear in the text box at the top of the keyboard screen.

1. Touch a text box on a screen.
   - The virtual keyboard appears.
2. Type letters and numbers as appropriate for the text box.
   - Letters and numbers appear in the box at the top of the screen as they are pressed.
   a) **To correct a mistake,** press the [BACKSPACE] button to erase the mistake and re-type the correct information. [BACKSPACE] will erase one letter at a time.
   b) **To type capital letters or symbols,** press either [SHIFT] key and then press the letter or symbol. The [SHIFT] key will automatically turn off after one letter or symbol has been pressed.
   c) **To type in all capital letters,** press the [CAPS] key. The keyboard will type in all capital letters until the [CAPS] key is pressed again.
3. Press the [DONE] button.
   - The virtual keyboard closes and your information is entered into the text box.
   - [CANCEL] closes the keyboard without entering any text into the text box.

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International Language Configuration

When the system is configured for a specific non-English speaking country, the virtual keyboard is also updated to provide for special characters and accents for that language. This keyboard will function similarly to a physical keyboard for that country (Figure A2-2).

The keyboard will provide access to these special characters through use of the [SHIFT] key, and the [AltGr] key.

The keyboard may provide a [Comp] key for adding accents to letters.

1. Press the [Comp] key.
2. Press the accent key.
3. Press the letter to which you want to add the accent.

Figure A2-2 Virtual keyboard for French

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Software Start Up and Shutdown

This section describes the procedure for starting up and shutting down the GE Portable DR Detector software only.

Start Up

Refer to Chapter 7: Maintenance and Service-Periodic Maintenance by Service Personnel (p. 7-1) for important information about the circuit breaker.

1. Turn the key switch to the ON position.
   - The unit performs diagnostics (self-tests to make sure everything is working correctly). This process takes a few seconds.
2. When the technique and battery status displays light up, the unit is ready for operation. TESTING COMPLETE will also briefly appear on the message display.
   - The unit may take 3 minutes for the digital detector software to boot up. You may drive the unit before the software finishes booting, but you cannot take acquisitions until the software is fully booted.
3. If SYSTEM -- XX FAILED is displayed, turn the unit OFF then ON again. If SYSTEM -- XX FAILED displays again, write down the alphanumeric code (XX represents the code) and contact your service representative.

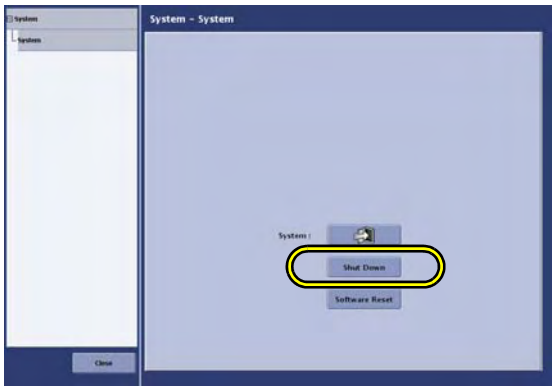
Shutdown

1. Close all current exams.
2. Press the [UTILITY] button at the top of the Worklist screen.

Figure A2-3 Utility button

3. Select **System** on the Utilities screen.

Figure A2-4 Utilities – System screen



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4. Press [POWER OFF]. Hold the button for 5 seconds.
   - A message appears: "The system will be shut down."

NOTE: Refer to Software Reset (p. A2-8) for information about the Software Reset function.

5. Press [YES] to proceed with shut down.
   - [CANCEL] stops the system from shutting down and returns you to the Utilities screen.

NOTE: You must wait 15 seconds after power is removed from the system before powering the system back up.

Login and Log off

This following sections apply if the system is configured for Login ability in the Service User Interface.

Refer to Appendix B: Login Administration for information on administering the login function.

Standard Login

The Login screen (Figure A2-5) appears when the system is started, reset, and after a user logs off. The system may also be configured to display the Login screen if the system has been inactive for a specified period of time (inactivity timeout).

Figure A2-5 Example login screen.

Follow this process to login to the system.

1. Start up the system or log off the previous user.
   - The Login screen appears.
2. Enter your **Login Name**, if necessary.
3. Type in your **Password**.

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4. Press [LOGIN].
   - The Worklist appears.

NOTE: If you have administrator access, a message appears: "You have both regular user and admin user privileges. To access the admin screen, select the check box before continuing with the login, otherwise just continue with the login."

- To login and begin working with the unit, press [LOGON] and the Worklist appears.
- To login and access login administrator functions, select the **Enter admin screen** checkbox and then press [LOGON]. The Login Administration screen appears. Refer to Appendix B: Log-in Administration for more information.

Invalid Password Message

Your Password must be entered correctly for you to log in. If the password you entered is not the correct password for the entered Login Name, an error message will appear.

1. Make sure that the correct **Login Name** is displayed in the field. Depending on the configuration, the Login Name may be case sensitive. That is, "aBc" is not the same Login Name as "Abc."
2. Retype your **Password** carefully. Your password is case sensitive; that is, "xYz" is not the same password as "Xyz."
3. Press [LOGON].
   - Contact your technical support group or system administrator if you still are not able to login.

Emergency Login

Emergency Login is a HIPAA required function to allow quick access to medical systems in the event of an emergency. Depending on the system's configuration, this option may not be available. Refer to Appendix B: Login Administration to configure the Emergency Login function.

Emergency Login will allow exposures, but does not allow connection to HIS/RIS or PACS hosts.

CAUTION: **The Emergency Login function should NOT be used when there is time to login normally, when there is time to receive assistance from technical support, or if there is no emergency situation. Your facility may track the use of this function.**

1. Press [EMERGENCY LOGON].
   - Depending on the system's configuration, you may be prompted to enter your name. Enter your name and press [LOGIN].
2. The Worklist screen appears.

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Inactivity Timeout

Depending on the system's configuration, the system may show the Login screen after a specified period of inactivity. The Login screen acts as a screen saver, covering displayed information to protect patient privacy.

The administrator configures if the system will timeout and how long the system must be inactive before the Login screen appears. Refer to Appendix B: Login Administration to configure the inactivity timeout function.

To access the system screens, follow the Standard Login or Emergency Login process described above.

Log Off

1. Close, suspend, or discontinue any open exams, if necessary.
2. Close the Image Viewer, if necessary.
3. Press [LOGOFF] at the top of the Worklist or Image Management screen.
   - Or open the Utility screen, go to **System** and press [LOGOFF] (Figure A2-6).

Figure A2-6 Utilities screen logoff button

   - A message appears: "Do you really want to log off?"
4. Press [OK].
   - The Login screen appears.
   - [CANCEL] closes the screen and returns you to the last screen.

Wireless Network Connection

Wireless is a purchasable option that allows the unit to connect to the facility wireless network without the cable. This allows you to update the Worklist or print and send images while the unit is moving or if you are in a location that does not have a cable network port. Please contact your GE Service representative to activate this option.

The unit cannot be connected to the network by both the wired and by wireless at the same time. To switch between wired and wireless, a software reset must be performed. The unit will automatically choose the wireless connection if the cable is not connected; if the cable is connected, the unit will choose the wired connection. Refer to Software Reset (p. A2-8) for more information.

1. To change from Wireless to Wired: Plug LAN data cable into system. Reset system at tools in preferences. Wired mode of transfer will be engaged
2. To change form Wired to Wireless: Unplug unit data cable from system. Reset system at tools in preferences. Wireless mode of transfer will be engaged. Icons will appear on the bottom of the screens.

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NOTE: Do not obstruct the antenna by covering it with metal, such as a lead apron. This will affect the signal strength.

The wireless icon appears on the bottom of the Worklist, Image Acquisition, Image Viewer, and Image Management screens. The icon shows wireless status (on or off) and the signal strength as described in Table A2-1.

Table A2-1 Wireless signal strength states

Icon	Description	Icon	Description
	"X" only – **Wireless feature disabled**		3 yellow bars – **Good** signal
	No colored bars, no "X" – **No signal**		4 green bars – **Very Good** signal
	1 red bar – **Extremely Low** signal		5 green bars – **Excellent** signal
	2 yellow bars – **Low signal**		

Software Reset

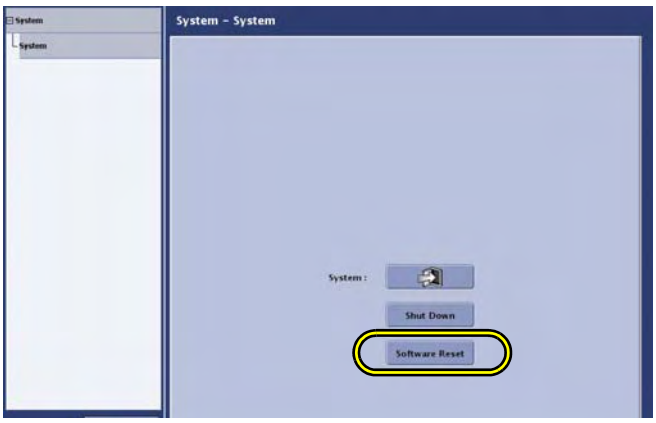
A software reset switches the unit between wired and wireless network connection. That is, the unit will automatically choose the wireless connection if the cable is not connected; if the cable is connected, the unit will choose the wired connection.

NOTE: Software reset **does not** require Shutdown or a System Reset.

Follow this process to perform a software reset.

1. Connect or disconnect the network cable as appropriate.
2. On the Worklist or Image Management screen, press [UTILITIES].
   - The System – System screen (Figure A2-7) appears.

Figure A2-7 System – System screen with Software Reset button



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3. Press [SOFTWARE RESET].
   - A message appears: “Press OK to restart Software Application. Press Cancel to return.“
4. Press [OK].
   - A “Loading Application” progress bar appears on screen.
   - The login screen appears once the software has been reset.
5. Login to the system to begin work.

System Reset

A controlled system reset should be performed once a week before routine QAP. Refer to Chapter A8: Quality Assurance Process and Maintenance for more information.

System reset is used as a last resort if the detector software stops working. A system reset may take 3 minutes to complete.

NOTE: The system will not be available for acquiring images during the reset cycle.

1. If possible, close, suspend, or discontinue any open exams.
2. If possible, log off the system.
3. Turn the key switch to the OFF position, then turn the key switch to the ON position and wait until the Login or Worklist screen appears.
   - As the system resets, various screens will appear on the monitor. This is normal.
   - The system will auto-start and either the Login screen or Worklist screen will appear (depending on how your system is configured) when the system is ready.

Lead Markers

As in any General Radiography procedure, lead marker placement is important to ensure markers are properly recorded on the image. Place the lead marker in an area of patient attenuation. If lead markers are placed in regions of direct radiation (saturation), there is a high risk they will be processed out of the image during image processing. Saturated areas beyond the anatomy are no longer part of the final image. This is most likely to happen on high technique exposures.

CAUTION: Exercise care when placing lead markers to guarantee their presence in the final image. Every attempt must be made to assure markers are not located in regions of direct radiation, but are located in regions where some patient attenuation of radiation is present without obstructing the anatomical information of interest.

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System Status and Messages

Several types of messages and indicators are displayed on the Acquisition Workstation screens to inform you of the system and subsystem operational status as well as error messages. The complete list of error messages is available in the Service Manual.

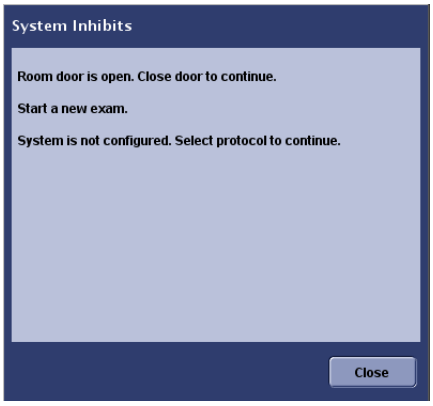
Expose Hold

The Expose Hold button (Figure A2-8) appears at the bottom of the Worklist or Acquisition screens when there is some condition that prevents an x-ray from being taken, such as exam is open or the protocol is not selected.

Press the Expose Hold button to view a list of all errors and interlocks that are preventing the exposure (Figure A2-8). The items are removed from the list as they are corrected. The Expose Hold button disappears when all errors and interlocks are corrected.

Figure A2-8 Worklist and Acquisition screen Expose Hold button

Figure A2-9 Example system Inhibits list


System Inhibits
Room door is open. Close door to continue.
Start a new exam.
System is not configured. Select protocol to continue.
Close

System Status Area

System status messages are displayed on the bottom of all main Workstation screens (Figure A2-10). System Status messages are displayed when the system detects an irregularity in system operation. The message informs you when remedial action is required to correct the situation.

A console beep announces the arrival of an informational message. There are situations where a system condition is detected that does not require stopping the procedure. The message tells you to Continue or to Continue/Call Service (continue and call service).

NOTE: To clear the system status area, open the Message Log (described below) and close it again.

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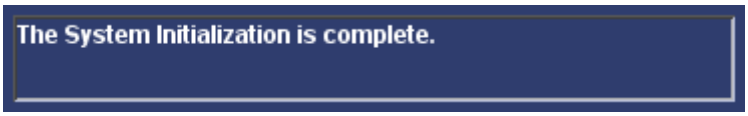
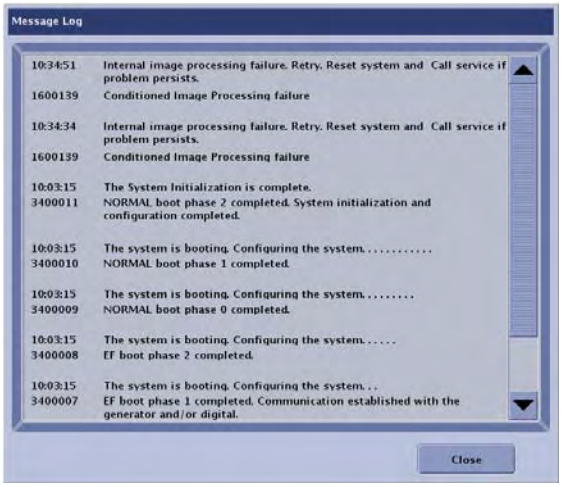
Figure A2-10 Example of a System Status message



Message Log

Pressing the Message Log button at the bottom of any screen opens the Message Log (Figure A2-11). The Message Log shows all status messages since the last system restart. The messages are listed in descending chronological order, that is, the latest message is listed first. This screen allows operators and service personnel to display, review, and analyze system status messages.

Figure A2-11 Message Log


Message Log
10:34:51 Internal image processing failure. Retry. Reset system and Call service if problem persists.
1600139 Conditioned Image Processing failure
10:34:34 Internal image processing failure. Retry. Reset system and Call service if problem persists.
1600139 Conditioned Image Processing failure
10:03:15 The System Initialization is complete.
3400011 NORMAL boot phase 2 completed. System initialization and configuration completed.
10:03:15 The system is booting. Configuring the system. . . . . .
3400010 NORMAL boot phase 1 completed.
10:03:15 The system is booting. Configuring the system. . . . . .
3400009 NORMAL boot phase 0 completed.
10:03:15 The system is booting. Configuring the system. . . . .
3400008 EF boot phase 2 completed.
10:03:15 The system is booting. Configuring the system. . .
3400007 EF boot phase 1 completed. Communication established with the generator and/or digital.
Close

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Chapter A3: Worklist

The Worklist is the starting point for patient set up and selecting procedures for acquisition. All exams begin from this screen.

The Worklist information and functions are based on DICOM standards.

This chapter explains the procedures for entering data into the system and setting up a patient.

Topics covered include:

- Overview (p. A3-1)
  - Patient List Columns (p. A3-6)
- Manage List / Find Procedures (p. A3-7)
  - Search (p. A3-7)
  - Sort by Column (p. A3-7)
  - Filter List (p. A3-8)
  - Refresh (p. A3-11)
- Select Procedures (p. A3-12)
- Delete Procedures (p. A3-12)
- Add / Edit Patient Information (p. A3-15)
  - Overview (p. A3-15)
  - Add Patient (p. A3-18)
  - Edit Patient Information (p. A3-19)

Overview

The Worklist (Figure A3-1) shows scheduled, completed, discontinued, suspended, and active procedures.

The majority of the Worklist is the Patient List. The Patient List is a large table made of columns and rows. Each row in the list is a procedure, or exam, to be performed. A patient may have multiple procedures (rows) on the Worklist.

Procedures listed can be classified under two categories:

- Locally entered procedures: This category refers to procedures entered directly on the mobile unit or system workstation by manually entering the information. Locally entered procedures are only available to the unit or workstation that they were entered on. They do not update automatically and no other units or workstations can access them.
- Hospital Information System (HIS) or Radiology Information System (RIS) Procedures: This category refers to procedures that the Worklist can automatically update from the central HIS/RIS database. Other units or workstations can be configured to access these procedures. If the GE Portable DR Detector is used in a mobile unit, the Worklist can only update with new information from the HIS or RIS if the unit is connected to the facility network.

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Figure A3-1 Worklist screen

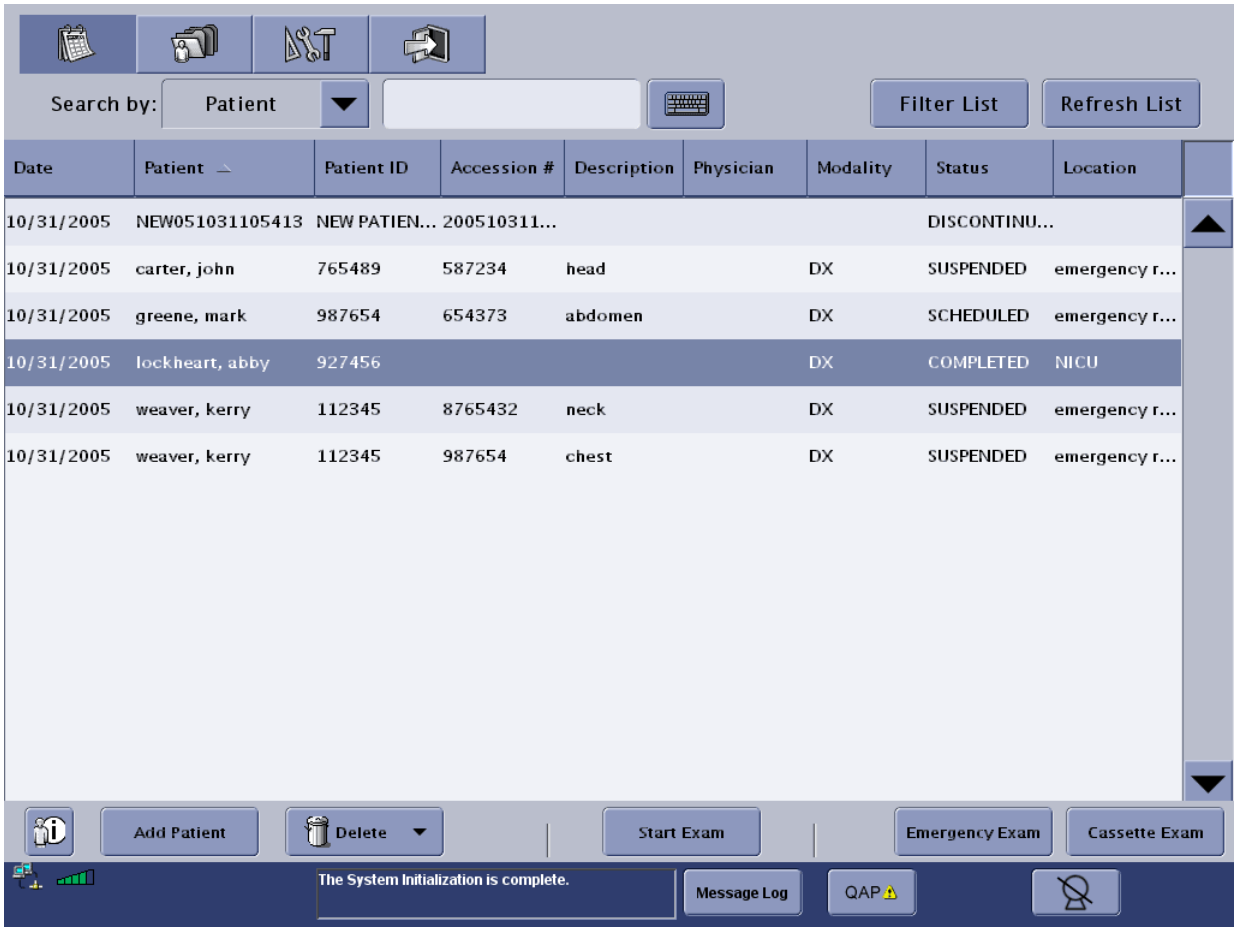

Table A3-1 lists and describes all the functions on the Worklist screen.

Table A3-1 Worklist Functions

Function	Description
navigation bar	Allows you to change between the Worklist, Image Management, and Utilities screens or allows you to logoff the system (if applicable). The darker color indicates which screen is currently displayed. The individual buttons are described below.
[WORKLIST]	Opens the Worklist screen where patient procedures may be added to the schedule and exams started.

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Function	Description
[IMAGE MANAGEMENT] 	Opens the Image Management screen where images may be selected for viewing or be copied to other exams. Refer to Chapter A6: Image Management for more information.
[UTILITIES] 	Opens a screen where system settings (such as Network and Printer connections) and preferences may be changed. If the Login function is enabled, the preferences you are allowed to change will vary depending on your level of access. Refer to Chapter A7: Set Preferences for more information.
[LOG OFF] 	If the Login function is enabled, pressing this button logs the current user off of the system. Refer to Chapter A2: General Information-Login and Log off (p. A2-5) for more information.
Search 	Searches for procedures by the selected column name in the drop-down list and the search criteria entered into the text box. For mobile units, Search is only available when the unit is connected to the network. Refer to Search (p. A3-7) for more information.
[KEYBOARD] 	Brings up the virtual keyboard so that you may type text into the Search text box. Refer to Chapter A2: General Information-Virtual Keyboard (p. A2-2) for more information.
[REFRESH LIST] 	Updates the Worklist view with new information from the HIS or RIS, which shows changes to the procedure records. Also removes any filters that have been applied. For mobile units, refresh is only available when the unit is connected to the network. Refer to Refresh (p. A3-11) for more information on automatically refreshing the Worklist.
[FILTER LIST] 	Displays a Worklist query screen and filters the RIS or HIS records to find procedures that meet specific criteria. For mobile units, filtering is only available when the unit is connected to the network. Refer to Filter List (p. A3-8) for information on how to filter the Worklist.

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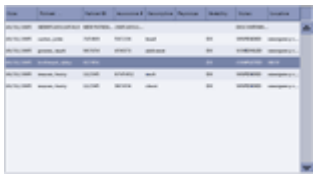
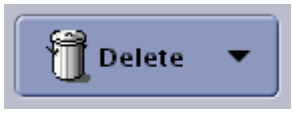
Function	Description
Patient List Area 	Shows all procedures scheduled for examinations during a working day. Procedures on the list may be downloaded from the RIS/HIS or may be created locally. The list may be sorted by column, searched, or filtered. Refer to Manage List / Find Procedures (p. A3-7) for more information. The time period displayed is configurable. Refer to Chapter A7: Set Preferences-Worklist (p. A7-13) for information on changing the time period displayed.
[PATIENT INFORMATION]	Shows the Patient Information screen for the selected procedure. **NOTE:** Patient Information is editable if the currently selected procedure has not been opened. Once the exam starts the Patient Information is no longer editable. Patient Information is not editable if multiple procedures are selected. Refer to Add / Edit Patient Information (p. A3-15) for more information.
[ADD PATIENT]	Allows you to enter patient information and adds the patient to the Patient List. Refer to Add / Edit Patient Information (p. A3-15) for more information.
[DELETE] or [DELETE ALL] 	Switches between [DELETE] and [DELETE ALL] to remove procedures from the Worklist. [DELETE] - Removes the selected procedure or procedures from the Patient List. [DELETE ALL] - Removes all completed and discontinued procedures from the Patient List. **NOTE:** [DELETE] or [DELETE ALL] does not remove procedures from the RIS or HIS or remove any exam images from the image database. Refer to Delete Procedures (p. A3-12) for more information.
[START EXAM] or [RESUME EXAM]	Starts, continues, or appends the selected procedure. The button name changes depending on the Scheduled Status of the selected procedure. If the selected procedure has a Status of "Suspended", the button name changes to [RESUME EXAM].

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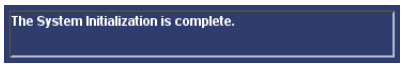
Function	Description
[EMERGENCY EXAM] 	Begins an exam without selecting a procedure from the Patient List or adding the patient. The system will assign a unique tracking number as the Patient Name. Refer to Chapter A4: Image Acquisition-Conduct an Emergency Exam (p. A4-12) for more information. The tracking number is the date and time the exam was initiated. The time is recorded to the second.
[CASSETTE EXAM] 	Begins a cassette exam. Cassette exams allow exposures to be taken without any digital patient record or image storage. Refer to Chapter A4: Image Acquisition-Conduct a Cassette Exam (p. A4-10) for more information.
network connection status 	Appears when the Definium AMX 700 is connected to the hospital network.
wireless network connection status 	If the wireless network connection is enabled, displays the status of the connection and signal strength. Refer to Chapter A2: General Information-Wireless Network Connection (p. A2-7) for more information.
system status 	Displays the last system status message. To clear the system status area, open the Message Log and close it again. Refer to Chapter A2: General Information-System Status and Messages (p. A2-10) for more information.
[MESSAGE LOG] 	Brings up the message log since the last system re-start. Refer to Chapter A2: General Information-System Status and Messages (p. A2-10) for more information.
[QAP] 	Brings up the screens that allow you to perform QAP. Refer to Chapter A8: Quality Assurance Process and Maintenance for more information.
[EXPOSE HOLD] 	Appears when there is some condition that prevents an x-ray from being taken. Press the button to view a list of all errors and interlocks that are preventing the exposure. The items are removed from the list as they are corrected. The button disappears when all errors and interlocks are corrected.

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Patient List Columns

Table A3-2 describes the columns on the Worklist. This information comes from what has been entered in the Patient Information screen. Refer to Overview (p. A3-15) for detailed descriptions of the information presented.

Table A3-2 Worklist columns

Column	Description
Date	The date the procedure is scheduled to occur. On locally added procedures, the current date is the default.
Patient	The full name of the patient as entered in Add Patient/Patient Information screen.
Patient ID	The patient's medical record number or any number that distinguishes the patient.
Accession #	The exam's accession number.
Description	The procedure ordered for the accession number. (This is the content of the Procedure Description field on the Add Information screen.)
Physician	The name of the physician or technician who performed the exam. (This is the content of the Performing Physician field on the Add Information screen.)
Modality	The modality of the procedure.
Status	The status of the procedure. Available options are: • Scheduled – procedure has been created but not started. • Completed – procedure has been closed. • Suspended – procedure was started then interrupted. • Discontinued – procedure was opened but cannot be completed. Refer to Chapter A4: Image Acquisition-End Exam (p. A4-13) for more information about Completed, Suspended, and Discontinued exams.
Location	For mobile units, the location of the patient within the facility.

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Manage List / Find Procedures

The Worklist has several features that allow you to find patients and procedures quickly and to organize the list to your preferences.

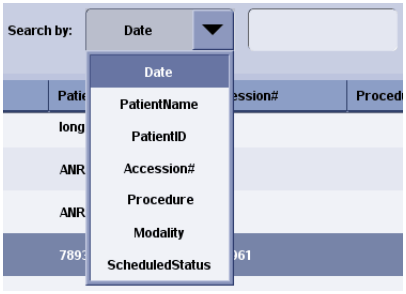
Search, Filters, and Sorting allow you to control the display of the procedures in the Worklist.

Search

The Search feature finds procedures by column.

For mobile units, Search is only available when the unit is connected to the network.

Figure A3-2 Search by column drop-down list



1. Press the button on the Search By drop-down list to select the column you want to search.
   - If the column you want is already selected, begin at step 3.
2. Select the column. For example, Patient Name.
   - The list is sorted by the selected column in alphabetical or numerical order.
3. Type the search criteria into the text box. For units equipped with touch screens, refer to Chapter A2: General Information-Virtual Keyboard (p. A2-2) for information on how to use the virtual keyboard to "type" information into a text box.
   - The list automatically goes to the first procedure that matches the entered criteria.
   - If the list is long enough, it will scroll to the first item so that it appears at the top of the list.

NOTE: The text box is not case sensitive. That is, it does not matter if you used upper or lower case.

- If no procedures match what you have typed, the list de-selects all procedures and places the closest match at the top of the Worklist.

Sort by Column

Sorting allows you to organize the procedures by the column of your choice.

1. Press the column heading you want to sort, or choose the column in the Search By drop-down list. For example, if you want to see all the procedures that have a status of "Suspended", press the "Status" column heading.
   - An arrow appears in the column heading to indicate which column is currently being sorted.

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2. Press the column heading again to switch between ascending and descending order.
   - An up-pointing arrow indicates that the column is sorted in ascending order. That is, sorted in alphabetical order or numerical order from smallest to largest.
   - A down-pointing arrow indicates that the column is sorted in descending order. That is, sorted in reverse alphabetical order or numerical order from largest to smallest.

Figure A3-3 Column with ascending sort

Filter List

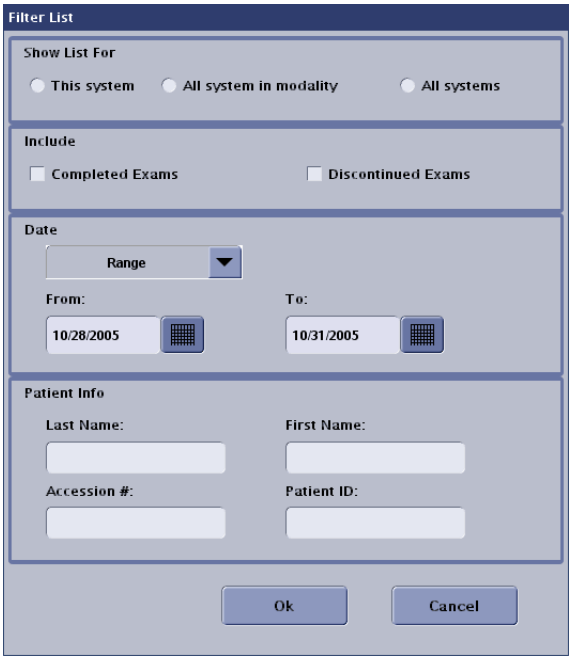
Use filters to only display items corresponding to your chosen criteria, e.g., exams taken only within a specified time period, patients whose last names begin with the letter 'J', or patient IDs beginning with the digits '547'.

Filters cannot be saved.

For mobile units, Filter List is only available when the unit is connected to the network. Also, mobile units will not be able to retrieve information from other units.

Pressing [REFRESH] will remove any filter that has been applied.

Figure A3-4 Worklist filter screen



The filter screen has several options for accepting or rejecting the information from the Worklist. Table A3-3 describes the filter screen functions.

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Table A3-3 Filter Acceptance/Rejection Buttons

Function	Description
Show list for	Filters the Worklist items by system or modality. • This system – procedures entered locally on the unit • All systems in modality – procedures for all digital x-ray • All systems – procedures for all modalities
Include	Allows you to include or exclude completed or cancelled (discontinued) exams in the filter.
Date	Allows you to select the date of exams to filter by. • All – procedures scheduled for any date • Range - procedures scheduled for a specified range of time • Today – procedures scheduled for the current date
From (mm/dd/yyyy) To (mm/dd/yyyy)	When the "Range" option is selected for the date, allows you to enter dates or pick dates from a calendar screen.
Patient Information	Allows you to filter based on data from the Patient Information screen. Available options are: • Last Name • First Name • Accession # • Patient ID The filter may be restricted by any or all of these fields. Leaving a field blank means that it will not be included in the filter.
[OK]	Applies the filter and returns you to the results on the Worklist.
[CANCEL]	Clears the Filter screen and returns you to the Worklist.

Follow this process to filter the Worklist.

NOTE: The fields may be completed in any order.

1. Press [FILTER LIST] on the Worklist screen.
   - The Filter Screen appears
2. Select the **Show list for** option.
3. Select the **Include** options.
4. Select the **Date** option.

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5. If you selected **Range** for the Date option, enter or select the **From** and **To** dates.
   - The current date appears in both the **From** and **To** fields by default.
   - To select dates from the calendar:

   a) Press the [CALENDAR] button.

Figure A3-5 Calendar button

   – The Filter calendar screen appears with the current date selected.

Figure A3-6 Filter calendar screen

   b) Press [◂] to select the previous month, if necessary.

   c) Press [▸] to select the next month, if necessary.

   d) Press a date to select it.
      – The calendar closes automatically when a date is clicked.

6. Enter any **Patient Information** you want to filter by.
   - You do not need to enter full words or numbers into these text boxes.
   - Entering more information into these text boxes will reduce the number of results.
   - Entering less or no information into these text boxes will increase the number of results.

NOTE: The Patient Information text boxes **are** case sensitive.

7. Press [OK].
   - The Filter screen closes and the Worklist screen appears with only those procedures that met all of the filtering criteria.
   - If no procedures met all the criteria, the Worklist will be blank.

8. Press [REFRESH] to remove the filter.

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Refresh

Some systems are configured to automatically refresh the Worklist with data from the HIS/RIS on a regular basis (such as every 10 minutes). However, if your system does not automatically refresh—or you want to refresh the list before the scheduled time—you are able to refresh the list manually.

For mobile units, Refresh only functions when the unit is connected to the network. If the unit is not connected to the network, pressing the [REFRESH] button only displays the current Worklist data.

The Refresh feature also removes any filtering that has been applied. Refer to Filter List (p. A3-8) for more information.

Manual Refresh

Follow this process to manually refresh the Worklist.

1. Press [REFRESH] on the Worklist.
   - The Worklist updates with HIS/RIS data and removes any filtering.

NOTE: Refresh does not remove locally added procedures.

NOTE: You will not be able to make selections or access Worklist functions while the Worklist is refreshing.

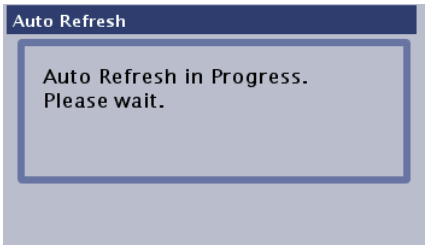
Auto Refresh

The Auto Refresh interval is set on the Preferences – Worklist screen in System Utilities. Refer to Chapter A7: Set Preferences-Worklist (p. A7-13) for more information.

When the system auto refreshes, a message (Figure A3-7) appears: “Auto Refresh in progress. Please wait.” The message remains until the refresh process is complete.

NOTE: You will not be able to make selections or access Worklist functions while the Worklist is refreshing.

Figure A3-7 Auto refresh message



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Select Procedures

Use the following processes to select a patient from the Worklist. This process assumes the patient already exists on the system. If the patient is not on the Worklist, you must add the patient first. Refer to Overview (p. A3-15) for more information.

Select a Single Procedure

1. Close or suspend any open exams, if necessary. Refer to Chapter A4: Image Acquisition-End Exam (p. A4-13) for more information.
   - The Worklist screen appears.
2. Select the procedure from the Worklist.
3. Refer to Chapter A4: Image Acquisition to conduct the exam.

Select Multiple Procedures

You may select multiple procedures for the same patient to begin image acquisition.

NOTE: The Patient Name, Patient ID #, and Exam Date must match exactly in order to be selected.

1. Sort the Worklist by Patient Name, if necessary.
2. Press procedure.
3. Press another procedure for the same patient.
4. Continue pressing procedures until all procedures for the patient are selected.
5. Press any other procedure to deselect the procedures.

Delete Procedures

You may remove procedures from the Worklist individually or all completed, discontinued, and locally added procedures at once.

The [DELETE] button is able to switch between individual delete or delete all.

NOTE: Deleted procedures cannot be recovered or “undeleted.”

To switch the button between “Delete” and “Delete All”:

1. Press on the small arrow on the right side of the button.
   - A list appears with the available actions.

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Figure A3-8 Delete button options

2. Press the action you want to perform.
   - The system performs the action and the button name changes to the selection you made. The button will perform the selected action each time it is pressed until you change it.

NOTE: [DELETE] or [DELETE ALL] does not remove procedures from the RIS or HIS. [DELETE] or [DELETE ALL] does not remove any exam images from the image database.

Delete a Single Procedure

1. Select the procedure to delete.
2. Press [DELETE]. If necessary, switch the button to [DELETE].
   - A message appears: "Are you sure that you would like to delete the selected items?"
3. Press [OK] to delete the procedures.
   - [CANCEL] retains the procedures and the Worklist appears.

Delete All Completed, Discontinued, and Local Procedures

1. Press [DELETE ALL]. If necessary, switch the button to [DELETE ALL].
   - A message appears: "All Completed, Discontinued, and locally scheduled exams will be deleted from this list. Any suspended exams will need to be individually deleted."
2. Press [OK] to delete the procedures.
   - The selected procedures are deleted and the Worklist appears.
   - [CANCEL] closes the message, retains the procedures, and takes you back to the Worklist.

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Delete Suspended Procedures

Suspended procedures cannot be deleted unless their status is changed to “Completed” or “Discontinued”

1. Select the suspended procedure to delete.
   - A message appears: “The patient entry you are trying to delete is still in progress. Would you like to mark the patient as ‘Completed’ / ‘Discontinued’ and proceed with deletion?”
2. Press [COMPLETE] or [DISCONTINUE].
   - [COMPLETE] changes the Status to of the procedures to “Completed.” If enabled, any acquired images are auto pushed, auto printed, and sent to PACS.
   - [DISCONTINUE] changes the Status to “Discontinued.” Any acquired images are marked as Discontinued and the information is sent to PACS.
   - [CANCEL] closes the message and returns you to the Worklist without deleting procedures.
   - The procedures are removed from the Worklist.

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Add / Edit Patient Information

Overview

The Add Patient (Figure A3-9) and Patient Information screens allow you to enter patient and procedure information before starting an exam or to view the information at any time.

NOTE: This screen may also be known as the Medical Procedure Card or MPC.

- To add a patient to the Worklist, press [ADD PATIENT] and enter or select the appropriate information.

NOTE: Make sure the patient's name, ID number, birth date, and gender information are entered correctly.

CAUTION: **Use only standard alphanumeric characters to complete the screen.**

- To view the patient information from the Worklist or Image Management screens, select the exam then press [PATIENT INFORMATION]. Patient information is not editable when launched from the Image Management screen.
- To view the patient information from the Acquisition or Image Viewer screens, press [PATIENT INFORMATION]. Patient information is not editable when launched from these screens.

Patient Information provided by the HIS/RIS is not editable.

Patient Information entered locally is editable until the exam is started. It is not editable after the exam is started or in progress.

NOTE: The Patient Information button is unavailable when multiple exams are selected at the same time.

Figure A3-9 Add Patient or Patient Information

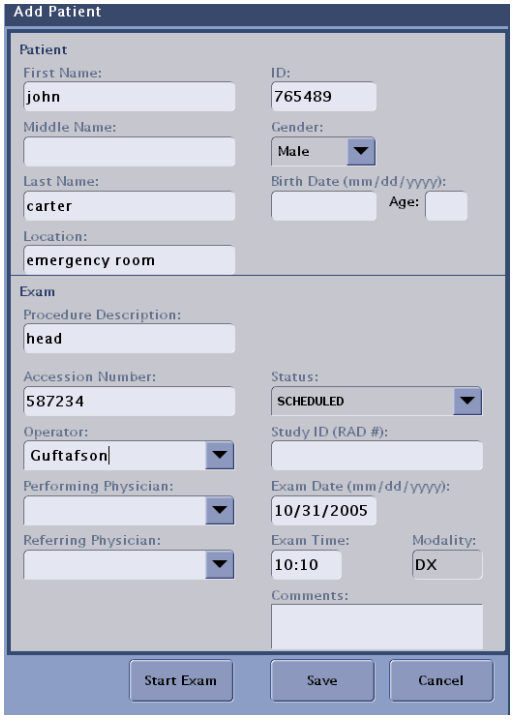

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Table A3-4 Patient Information description

Function	Description
Patient Section	
First Name	Identifies the patient's first name.
Middle Name	Identifies the patient's middle name or initials.
Last Name	Identifies the patient's last name. **NOTE:** Emergency Exams automatically fill this field with a system-generated identification, which is the word "NEW" followed by a date and time stamp of the second the Emergency Exam button was pressed. For example: NEW050622140345. The exam was initiated in year 05, month 06, day 22, hour 14, minute 03, and second 45.
Location	Identifies the patient's location. The HIS or RIS usually completes this field.
ID	Identifies the patient's medical record number or any number that distinguishes the patient. This number must be unique.
Gender	Defines the sex of the patient. By default, "Other" is selected when the screen first opens.
Birth Date	Identifies the patient's birthday in the format dd/mm/yyyy. If the date is not entered in the correct format, the screen will show the date field in red when [START EXAM] or [SAVE] is pressed. In the above example, the year was entered with only 2 digits ("45" instead of "1945").
Age	Identifies the patient's age. The field updates with the correct age when the Birth Date is entered.
Exam Section	
Procedure Description	Describes the procedure or series to be performed.
Accession Number	Identifies the exam's accession number.
Operator	Identifies the operator's name or initials. You can use the drop-down list to select commonly used names, or type the name into the drop-down list box. Refer to Chapter A7: Set Preferences-Preset Names (p. A7-15) for information on adding names to the drop-down list.

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Function	Description
Performing Physician	Identifies the Radiologist or performing physician. You can use the drop-down list to select commonly used names, or type the name into the drop-down list box. Refer to Chapter A7: Set Preferences-Preset Names (p. A7-15) for information on adding names to the drop-down list.
Referring Physician	Identifies the referring physician. You can use the drop-down list to select commonly used names, or type the name into the drop-down list box. Refer to Chapter A7: Set Preferences-Preset Names (p. A7-15) for information on adding names to the drop-down list.
Status	Displays the status of the selected exam. When adding a patient, the only option is “Scheduled”. Patient Information options are: • Scheduled - The procedure has been added to the Worklist, but the exam has not started. • Suspended - An exam was started but interrupted before completion. The exam may be resumed at a later time. • Complete - The exam is one that has been “Closed” on the Acquisition screen or marked as “Complete” on the Patient Information screen. Completed exams are sent to the PACS (where available). • Discontinued - The procedure was opened, but no exposures were taken. The exam may be started at a later time or the procedure deleted. • In progress - The exam is currently in progress.
Study ID (RAD #)	Displays the procedure ID number.
Exam Date	Sets the scheduled date of the selected exam. By default, the current date is automatically inserted. You may change this date as necessary.
Exam Time	Sets the time for the patient’s exam to be performed. By default, the time when the [ADD PATIENT] button was clicked is automatically inserted. You may change this time as necessary.
Modality	Displays the modality of the exam. The abbreviation for x-ray is DX.
Comments	Provides a space for any notes or information not listed in any other field.
[START EXAM]	Displays the Select Protocol screen in preparation for making exposures. Refer to Chapter A4: Image Acquisition-Select or Change Protocols (p. A4-7) for more information.This also adds the patient name to the Worklist. **NOTE:** This button does not appear if the Patient Information screen is opened from the Image Viewer or Image Management screens.

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Function	Description
[SAVE]	Adds the patient to the Worklist or saves changes and closes the Add Patient/ Patient Information screen. • If the Save button is selected but all of the data fields have not been filled in, a new patient is created anyway. • If no patient name has been entered, then the patient name will be listed as "New Patient". This allows you to start an exam quickly.
[CANCEL]	Erases all newly entered information and closes the Add Patient/Patient Information screen without updating the Worklist.

Add Patient

Use this procedure to enter the patient's information into your system.

1. Open the Worklist screen.
   - The Patient Worklist screen appears.
2. Press [ADD PATIENT].
   - The Add Patient screen appears.
3. Enter the patient information.

CAUTION: Make sure the patient's name, ID number, birth date, and gender information are entered correctly.

4. Press [SAVE] or [START EXAM].
   - Press [SAVE] to add the patient to the Worklist and return to the Worklist screen.
   - Press [START EXAM] (if available) to add the patient to the Worklist and begin Acquisition.
   - Press [CANCEL] to close the Add Patient screen without saving changes.

NOTE: For a new exam on a existing patient, the patient information cannot be edited.

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Edit Patient Information

Patient information can only be edited before any procedure has been opened.

NOTE: You may only edit patient information for one procedure at a time. If multiple procedures are selected, the [PATIENT INFORMATION] button is disabled.

1. Select the procedure from the Worklist.
2. Press [PATIENT INFORMATION].
   - The Patient Information screen appears.
3. Edit the information as necessary.
4. Press [SAVE] to record the changes and return to the Worklist.
   - Pressing [CANCEL] closes the Patient Information screen without saving changes.

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Chapter A4: Image Acquisition

This section details the process of acquiring images using the GE Portable DR Detector or free cassette.

Topics covered include:

- Overview (p. A4-1)
- Re-start Completed or Discontinued Exams (p. A4-6)
- Resume Suspended Exams (p. A4-7)
- Select or Change Protocols (p. A4-7)
- Conduct a Digital Exam (p. A4-9)
- Conduct a Cassette Exam (p. A4-10)
- Conduct an Emergency Exam (p. A4-12)
- End Exam (p. A4-13)
  - Suspend (p. A4-13)
  - Close (p. A4-14)
  - Discontinue (p. A4-14)

Overview

The Acquisition screen (Figure A4-1) is where the exam is set up and exposure details are adjusted. This screen appears when you press the [START EXAM], [EMERGENCY EXAM], or [CASSETTE EXAM] buttons on the Worklist or [START EXAM] from the Add Patient screen.

NOTE: If you pressed the [CASSETTE EXAM] button, the Acquisition screen will present a limited set of options. Refer to Conduct a Cassette Exam (p. A4-10) for more information about cassette exams.

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Figure A4-1 Acquisition screen

Table A4-1 Image Acquisition functions

Function	Description
patient identification	Identifies the patient name and patient identification number for the current procedure.
[PATIENT INFORMATION]	Displays Patient Information screen for the current procedure. Refer to Chapter A3: Worklist-Add / Edit Patient Information (p. A3-15) for more information.
screen switch tab	Switches between the Acquisition and Viewer screens. **NOTE:** When acquiring multiple images or if you need to retake an image, you must switch back to the Acquisition screen in order to record the exposure.

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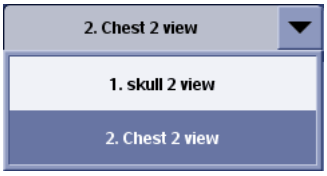
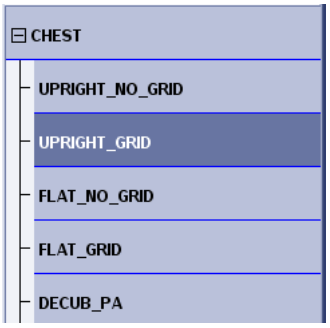
Function	Description
exam 	If multiple exams were selected from the Worklist, switches between exams for protocol selection, technique adjustment, and acquisition. This drop-down list does not appear if a single exam was selected, or if the exam was initiated with the Emergency Exam or Cassette Exam buttons on the Worklist.
protocol list 	Lists the available views for the exam and shows which view is currently active.
[SELECT PROTOCOLS] 	Brings up the Select Protocols screen to add, remove, or change protocols. Refer to Select or Change Protocols (p. A4-7) for more information.
[SUSPEND] 	Ends the exam with the intent of continuing at a later time. Does not initiate auto send or auto print, if enabled. Refer to End Exam (p. A4-13) for more information.
[CLOSE] 	Closes the procedure. If enabled, [CLOSE] sends billing information to the PACS system, auto sends, and auto prints acquired images. Refer to End Exam (p. A4-13) for more information.
[DISCONTINUE] 	Ends the exam when the procedure has been opened but the exam cannot continue. Refer to End Exam (p. A4-13) for more information.

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Function	Description
Patient Size: 	Allows you to choose the size of the patient being x-rayed. Available options are: • Medium Pediatric (toddlers to 5 years old) • Small Adult • Medium Adult • Large Adult **NOTE:** Pediatric techniques are set at different system speeds then adult techniques. For example, the system speed for a pediatric exam of 70 kV at 32 mAs is 800. The default system speed for an adult exam of 70 kV at 32 mAs is 400.
Receptor: 	Selects the receptor for the protocol. In order from left to right, the options are: • Free Cassette • GE Portable DR Detector **NOTE:** The generator limits exposure time to two (2) seconds for both receptors.
Reset Technique: 	Resets the technique to the default protocol settings.
Grid position 	Shows the recommended grid position for the technique.
SID 	Shows the recommended SID for the technique.
kV 	Adjusts the kV. The up/down buttons on the right of the field adjust the kV by one unit. The buttons on the left of the field adjust the kV by 5 units. The kVp selection range is 40-150, in1 kVp increments.

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Function	Description
mAs 	Adjusts the mAs. The mAs selection is in Renard steps. The available selections are: 0.1, 0.12, 0.16, 0.20, 0.25, 0.32, 0.40, 0.50, 0.64, 0.80, 1.0, 1.25, 1.6, 2.0, 2.5, 3.2, 4.0, 5.0, 6.4, 8.0, 10.0, 12.5, 16.0, 20.0, 25.0, 32.0, 40.0, 50.0, 64.0, 80.0, 100.0, 125.0, 128.0, 160.0, 200.0, 250.0, 256.0, 320.0, 400.0, 500.0, 512.0. **NOTE:** Not all mAs selections are available at all kV settings.
Patient Side: 	If conducting an exam on paired anatomy (for example, extremities), selects the side of the patient being x-rayed. Options are: • Both • Left • Right If conducting an exam on unpaired anatomy, the control is disabled and displays "Unpaired", as shown here.
Recommended Position: 	Displays the recommended patient position relative to the detector.
network connection status 	Appears when the Definium AMX 700 is connected to the hospital network.
wireless network connection status 	If the wireless network connection is enabled, displays the status of the connection and signal strength. Refer to Chapter A2: General Information-Wireless Network Connection (p. A2-7) for more information.
system status 	Displays the last system status message. **NOTE:** To clear the system status area, open the Message Log and close it again. Refer to Chapter A2: General Information-System Status and Messages (p. A2-10) for more information.
[MESSAGE LOG] 	Brings up the message log since the last system re-start. Refer to Chapter A2: General Information-System Status and Messages (p. A2-10) for more information.

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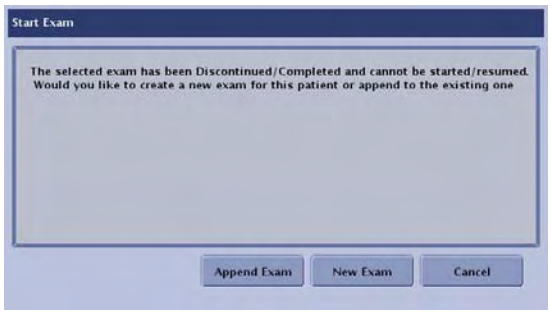
Function	Description
[QAP] 	When the yellow alert icon is present, indicates that QAP should be performed to ensure continued image quality. **NOTE:** QAP cannot be performed when the Image Acquisition or Image Viewer screens are displayed. End the exam before attempting to perform QAP. Refer to Chapter A8: Quality Assurance Process and Maintenance for more information.
[EXPOSE HOLD] 	Appears when there is some condition that prevents an x-ray from being taken. Press the button to view a list of all errors and interlocks that are preventing the exposure. The items are removed from the list as they are corrected. The button disappears when all errors and interlocks are corrected.

Re-start Completed or Discontinued Exams

Procedures with a Status of “Completed” or “Discontinued” cannot be re-opened. However, you may create a new exam or append the existing exam.

1. Select the procedure(s) from the Worklist.
2. Press [PATIENT INFORMATION] to verify the patient, if necessary.
3. Press [RESUME EXAM].
   - A message appears: “The selected exam has been Discontinued/Completed and cannot be started/resumed. Would you like to create a new exam for this patient or append to the existing exam?”

Figure A4-2 Start a discontinued or completed exam message


Start Exam
The selected exam has been Discontinued/Completed and cannot be started/resumed.
Would you like to create a new exam for this patient or append to the existing one
Append Exam
New Exam
Cancel

4. Press the button of the action to perform.
   - [APPEND EXAM] creates a new series within the existing exam and opens the Select Protocols screen.

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NOTE: The new exam will be placed under the same accession number as a new series. Check your facility's conformance standards before selecting this option because it may effect HIS/RIS or PACS formats.

- [NEW EXAM] creates a new exam and series for the patient and opens the Select Protocols screen.
- [CANCEL] closes the message and returns you to the Worklist.

5. Refer to Select or Change Protocols (p. A4-7) to continue with the exam.

Resume Suspended Exams

Suspended exams may be resumed at any time. The process of resuming a suspended exam is the same as starting a new exam.

1. Select the exams from the Worklist.
2. Press [RESUME EXAM].

NOTE: Protocol selections and technique changes are not saved in a suspended exam. Protocols must be reselected and techniques must be re-set.

Select or Change Protocols

The Select Protocols screen (Figure A4-3) appears when you press [START EXAM] on the Worklist or Add Patient screen or when you press [SELECT PROTOCOLS] on the Acquisition screen.

The select protocols screen is divided into two halves: Available Protocols on the left and Selected Protocols on the right.

- Available Protocols lists all the protocols currently listed in the database, categorized by anatomical region: for example, head, chest, spine, and abdomen. Each category expands to show the exam(s) for that category.
- Selected Protocols lists all currently selected protocols in the following format: anatomy / exam. This list automatically updates as protocols are selected or removed.

Refer to Chapter A7: Set Preferences-Protocols (p. A7-39) for information on adding protocols to the protocol database.

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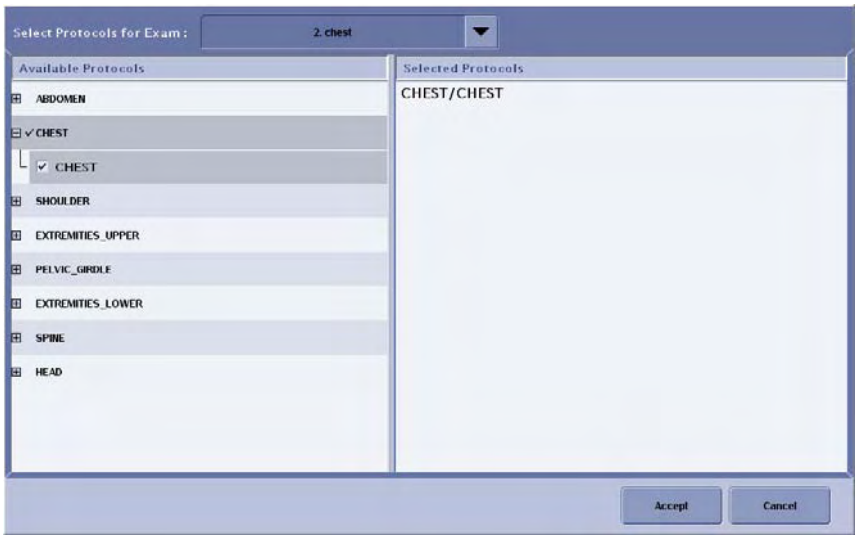
Figure A4-3 Select Protocols



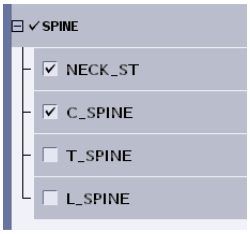
Use this process to select or change protocols for a procedure.

1. If multiple procedures were selected from the Worklist, select the procedure from the drop-down list.

Figure A4-4 Select procedure

2. Press on an anatomical category (Available Protocols side) to open it.
   - The category expands to show the available exams.
   - Press on the anatomical category name again to close it.
3. Press on an exam to select it.
   - A checkmark appears in the box to the left of the exam name.
   - A checkmark appears next to the category name. This indicates that the category has at least one exam selected.

Figure A4-5 Selected exams



   - The category and exam name appear in the Selected Protocols list.
4. Press the exam again to de-select it.
   - The category and exam name are removed from the Selected Protocols list.

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5. Repeat process until all exams are selected for all procedures.
6. Press [ACCEPT] when finished.
   - The Select Protocols screen closes.
   - The Acquisition screen appears.
   - [CLOSE] removes the selections and returns you to the Worklist.
7. Refer to Conduct a Digital Exam (p. A4-9) or Conduct a Cassette Exam (p. A4-10) to continue the exam.

Conduct a Digital Exam

This section describes the adjustments required when conducting a digital exam.

Follow this process to conduct an exam using the GE Portable DR Detector.

NOTE: If you need to interrupt the exam and resume it at a later time, press the [SUSPEND] button. You will be returned to the Worklist.

1. If multiple procedures were selected from the Worklist, select the procedure from the exam drop-down list.
2. Select the **Exam** and **View** to perform from the protocol list.
3. Select the **Patient Size**. The system default is Medium Adult.

NOTE: To optimize processing for the best image quality, Patient Size should be confirmed for each view. Available options are:

- Medium Pediatric (toddlers to 5 years old)
- Small Adult
- Medium Adult
- Large Adult

WARNING: **It is critical to select the proper patient size on the Acquisition screen. The incorrect Patient Size may result in an unnecessarily large radiation dose or multiple exposures.**

4. Select the **GE Portable DR Detector receptor**, if necessary.

Figure A4-6 Receptors: GE Portable DR Detector selected

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5. Confirm or adjust the **Grid** and **SID** based on the recommendations for the protocol.
   - The screen only shows the recommended Grid and SID. The system does not report the current Grid and SID status.
6. Make technique adjustments as necessary: **kV** and **mAs**.

NOTE: Press [RESET TECHNIQUE] at any time to reset the technique to the default protocol settings.

7. Position the GE Portable DR Detector under the patient.
8. Confirm or adjust the **Patient Side,** if applicable.
9. Collimate and shield as appropriate for the exam.
10. Have the patient suspend respiration, if required.
11. Make exposure using the hand switch or TechSwitch.
    - The image appears on Image Viewer screen.

NOTE: It takes about 9 seconds for a fully processed image to appear on the Image Viewer screen.

12. Press the **Acquisition** tab to switch back to the Acquisition screen.

Conduct a Cassette Exam

The Cassette Exam function takes an x-ray without digital image acquisition and storage or electronic information sending and retrieval. This is for use with a traditional Film Screen or CR cassette.

When the cassette receptor is selected, a message appears near the bottom of the screen: “CAUTION: Non-digital Exposure. Ensure that film is in place.“

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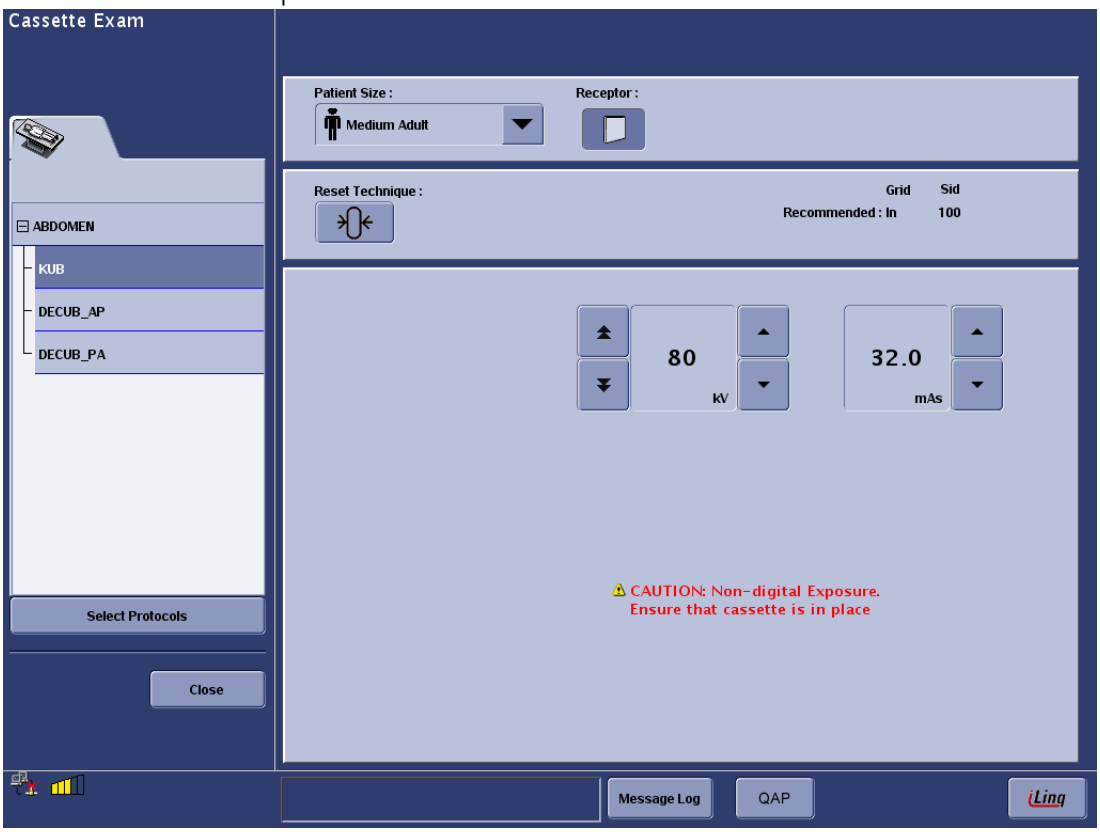
Figure A4-7 Cassette exam Acquisition screen



Follow this process to conduct a Cassette Exam.

NOTE: Make sure that the GE Portable DR Detector is in the detector bin **before** beginning a cassette exam. Exposures will be inhibited if the detector is placed in the bin after the exam has begun. To clear the inhibit, either:

- Select a different view and then reselect the view you wish to perform as shown in step 4 below (recommended).
- Remove the detector from the bin for the duration of the exam.

Refer to Chapter 3: Hardware Overview-Unit Features (p. 3-1) for more information about the detector bin.

1. Press [CASSETTE EXAM] from the bottom of the Worklist screen.

NOTE: Because a cassette exam does not use digital image storage, you do not select procedures from the Worklist.

Figure A4-8 [CASSETTE EXAM] button on Worklist

- The Select Protocols screen appears.

2. Select the protocols to perform.

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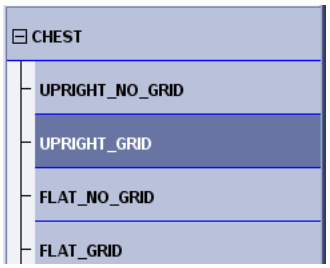
3. Press [ACCEPT].
   - The Acquisition screen appears in Cassette Exam mode.
4. Select the Exam and View to perform from the protocol list.



5. Make technique adjustments as necessary for the appropriate body part being imaged: **kV** and **mAs**

NOTE: For film and CR cassette work, use your site's routine techniques as with any other mobile system. For ease of use, these techniques can be programmed into the protocol database. Refer to Chapter A7: Set Preferences-Edit Protocol Database (p. A7-41) for more information.

6. Position the patient with the cassette as appropriate for the exam.
7. Collimate and shield as appropriate for the exam.
8. Have the patient suspend respiration, if required.
9. Make exposure using the hand-switch.
10. Press [CLOSE] to end the exam.
    - The Worklist appears.
11. Process the cassette as necessary, depending on the media.

Conduct an Emergency Exam

Emergency Exam is a function that allows a patient to be x-rayed without selecting the patient from the Worklist or adding the patient to the Worklist.

Figure A4-9 Emergency Exam button

Emergency Exam is used in the following situations:

- Medical emergency – The patient needs an x-ray taken immediately.
- No patient information available – There is no patient information to enter due to the patient's medical condition. For example, the patient was found unconscious with no identification.

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When the [EMERGENCY EXAM] button is pressed, the system assigns a unique tracking number as the Patient Name. The tracking number is the word "NEW" followed by a date and time stamp of the second the Emergency Exam button was pressed. For example: NEW070422140345. In this example, the number sequence means that the exam was initiated in year 07, month 04, day 22, hour 14, minute 03, and second 45.

The tracking number is used as the Patient Name on image annotation and as the Patient ID.

NOTE: When the patient information becomes available, images can be copied into the appropriate Worklist selection. The selection can be populated to the Worklist either by HIS/RIS or manual entry. Refer to Chapter A6: Image Management-Open Exams and Images (p. A6-9) for more information.

Once initiated, an emergency exam is conducted the same way as any other exam.

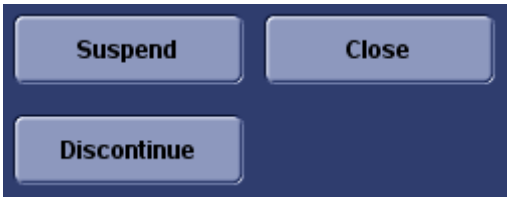
Follow this process to conduct an emergency exam.

1. Press [EMERGENCY EXAM] from the bottom left of the Worklist.
   - The Select Protocols screen appears. Refer to Select or Change Protocols (p. A4-7) for more information.
2. Select the protocols for the exam.
3. Press [ACCEPT].
   - The Acquisition screen appears.
4. Select the protocol to perform from the Protocol List.
5. Acquire images. Refer to Conduct a Digital Exam (p. A4-9) or Conduct a Cassette Exam (p. A4-10) for more information.

End Exam

There are several ways to end an exam: Suspend, Close, and Discontinue. Each method is used for a specific purpose to cover a variety of different situations.

Figure A4-10 Buttons used to end exams



Suspend

Suspend is for situations when you must leave the exam but intend to resume it at a later time. Suspending an exam does not initiate auto send or auto print functions (if enabled). Images acquired from a suspended exam do not appear on the Image Management screen. Any acquired images are stored in a temporary database until they are committed to the permanent storage database upon closure of the exam.

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Close

Close is used when the exam is complete; that is, you have acquired all images and do not intend to continue. If enabled, Close sends the images to PACS and initiates auto print and auto send functions. The images are committed to the permanent storage database and the exam appears on the Image Management screen. This is the only exam end option available when conducting a cassette exam.

Discontinue

Discontinue an exam when you have opened the procedure but cannot continue the exam. Any images that were acquired are marked so that they are not used by PACS.

When an exam is discontinued, you must provide the reason for discontinuing the exam. The system sends the status and reason together to the HIS/RIS.

The available reasons are:

- Doctor cancelled procedure
- Equipment failure
- Incorrect procedure ordered
- Patient allergic to media/contrast
- Patient died
- Patient refused to continue procedure
- Patient taken for treatment or surgery
- Patient did not arrive
- Patient pregnant
- Change of procedure for correct charging
- Duplicate order
- Nursing unit cancel
- Incorrect side ordered
- Discontinue for unspecified reason
- Incorrect worklist selection

NOTE: The reason for discontinuing an exam cannot be seen on the Worklist or Patient Information. The information is added to the DICOM header.

Use this procedure to discontinue an exam.

1. Press [DISCONTINUE] from the bottom of the Acquisition screen.
   - A message appears: “Please select a reason for discontinuing this exam.”
2. Select the option that best describes why the exam is being discontinued.
   - Choose “Discontinue for unspecified reason” if no other options describe the current situation.
3. Press [OK].
   - The message closes and the Worklist screen opens.
   - The status of the procedure changes to “Discontinued” on the Worklist.
   - If multiple procedures were selected, the discontinued status applies to all procedures that were open when the exam was discontinued.
   - Press [CANCEL] to close the message and return to the Acquisition screen.

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Chapter A5: Image Viewer

The Image Viewer screen (Figure A5-1) appears on the touch panel once an exposure is taken in a live exam or when an image series is chosen from the Image Management screen for review. This screen is where images are adjusted and viewed.

Topics covered include:

- Overview (p. A5-1)
- Tool Panel Selection (p. A5-4)
- Select Images to View (p. A5-5)
- Change Image Display (p. A5-6)
- Adjust Images (p. A5-7)
- Annotate and Mask Images (p. A5-9)
  - Customize System Annotations (p. A5-12)
  - Add Image Annotations (p. A5-13)
  - Delete Image Annotations (p. A5-15)
  - Adjust Image Shutter (Crop Image) (p. A5-15)
- Re-process Images (p. A5-17)
- Determine if Images should be Retaken (DEI) (p. A5-18)
- Change Pointer Controls (p. A5-21)
- Apply Quality Check Indicator (Auto Tag) (p. A5-22)
- Print Images (p. A5-22)
- Send Images (p. A5-27)
- Save Changes to Images (p. A5-27)

Overview

The Viewer shows all images in the study. All series within the study are listed and can be seen in the Viewer.

The left side of the screen contains all the image selection and adjustment tools. Most of the tools are categorized into panels that can be selected to reveal different functions.

The majority of the screen (Figure A5-1) is devoted to image display. The images on the right side of the screen update as adjustments are made. You are able to view single or multiple images at once. When viewing multiple images, an aqua border identifies the currently selected image.

Table A5-1 describes the functions for the Image Viewer screen.

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Figure A5-1 Image Viewer screen

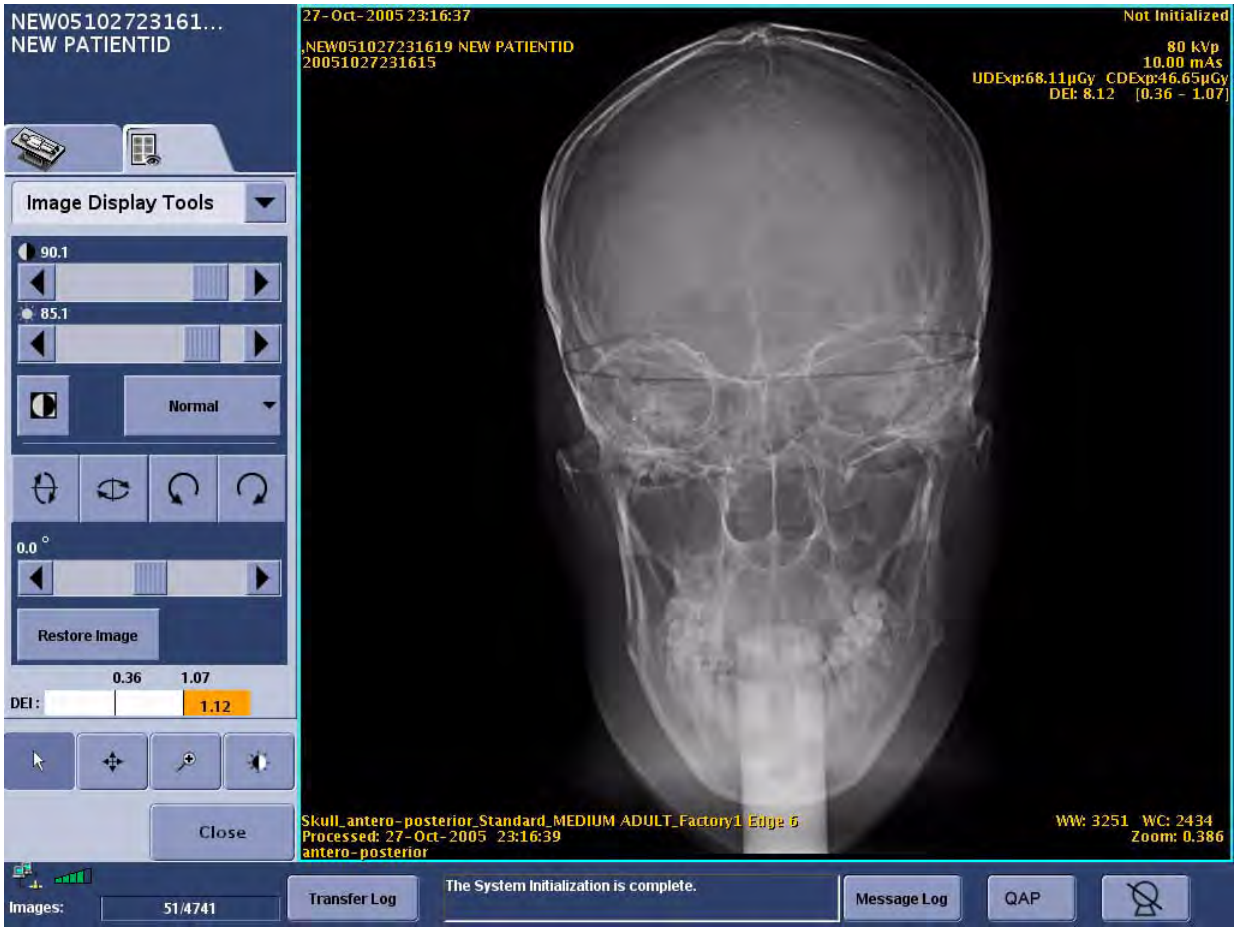

Table A5-1 Image Viewer screen functions

Function	Description
patient Identification NEW05102723161... NEW PATIENTID	Identifies the Patient Name and Patient ID as entered on the Patient Information screen.
screen switch tab 	If in an active exam, allows you to switch back to the Acquisition screen. If viewing images from a completed exam, the Acquisition screen tab is disabled. **NOTE:** When acquiring multiple images or if you need to retake an image, you must switch back to the Acquisition screen in order to record the exposure.

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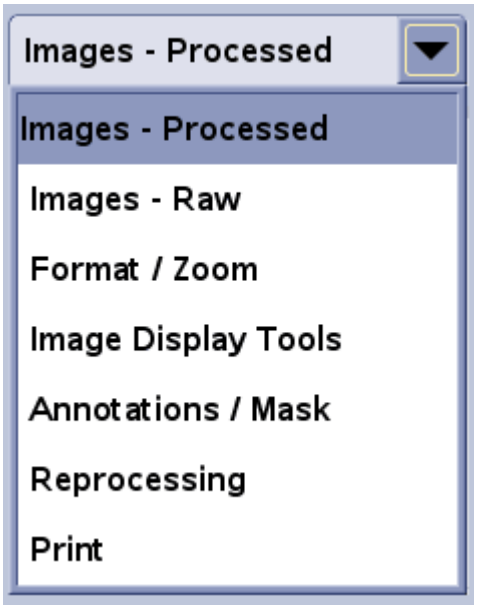
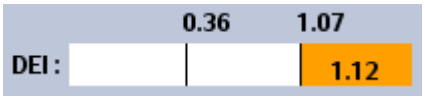
Function	Description
tool selection list 	Switches between different tool panels that allow you to change the image display or manipulate the image. Available options are: • Images – Processed: Shows small previews of all processed images in the selected series and highlights the images currently shown in the Viewer. The images are categorized by exam and series. Refer to Select Images to View (p. A5-5). • Images – Raw: Shows small previews of all raw images in the selected series and highlights the images currently shown in the viewer. The images are categorized by exam and series. Refer to Select Images to View (p. A5-5). • Format/Zoom: Controls how many images appear in the Image Viewer screen at one time and adjusts the magnification of each image. Refer to Change Image Display (p. A5-6). • Image Display Tools: Contains the tools to flip, rotate, adjust brightness, adjust contrast, invert, and apply windowing to images. Refer to Adjust Images (p. A5-7). • Annotations/Mask: Contains the tools to annotate and crop images. Refer to Annotate and Mask Images (p. A5-9). • Reprocessing: Changes the processing settings. Refer to Re-process Images (p. A5-17). • Print: Controls the printing of images. Refer to Print Images (p. A5-22).
DEI (Detector Exposure Index) 	If enabled, displays the dose received by the detector and whether the dose is within an acceptable range for the anatomy. You may need to re-take images that show doses below the acceptable range. Refer to Determine if Images should be Retaken (DEI) (p. A5-18) for more information. **NOTE:** Depending on your system's configuration, the DEI may only show a numerical value. Refer to Chapter A7: Set Preferences-Image Viewer (p. A7-25) to configure the Detector Exposure Index.
pointer controls 	Changes the action of the pointer when pressed and dragged on the image. Refer to Change Pointer Controls (p. A5-21) for more information.

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Function	Description
[CLOSE] 	Closes the Image Viewer screen and prompts you to save any changes to images. Close also initiates auto print and auto push, if enabled. Refer to Save Changes to Images (p. A5-27) for more information.
network connection status 	Appears when the Definium AMX 700 is connected to the hospital network.
wireless network connection status 	If the wireless network connection is enabled, displays the status of the connection and signal strength. Refer to Chapter A2: General Information-Wireless Network Connection (p. A2-7) for more information.
image database size 	Shows how many images are currently saved to the local database and approximately how many more images the database can accommodate.
system status 	Displays the last system status message. **NOTE:** To clear the system status area, open the Message Log and close it again. Refer to Chapter A2: General Information-System Status and Messages (p. A2-10) for more information.
[MESSAGE LOG] 	Brings up the message log since the last system re-start. Refer to Chapter A2: General Information-System Status and Messages (p. A2-10) for more information.
[QAP] 	When the yellow alert icon is present, indicates that QAP should be performed to ensure continued image quality. **NOTE:** QAP cannot be performed when the Image Acquisition or Image Viewer screens are displayed. End the exam or close the images before attempting to perform QAP. Refer to Chapter A8: Quality Assurance Process and Maintenance for more information.

Tool Panel Selection

Different tools and controls are accessed through the Tool Selection list. Press the down-arrow to see a list of all choices.

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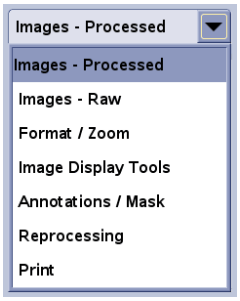
The following sections describe the tools and their functions.

Figure A5-2 Tool selection list



Select Images to View

The Images - Raw and Images - Processed panels (Figure A5-3) allow you to select images to view. Both the Raw and Processed panels function the same way. The difference is that the Raw panel shows images as they were acquired and the Processed panel shows images that have been processed.

NOTE: When viewing or adjusting images from a completed exam, always work with processed images.

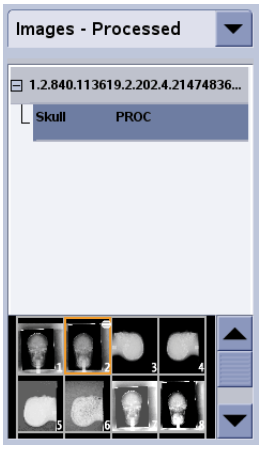
The top half of the tool panel shows the different exams and series that are available. When you select a series, previews (or "thumbnails") of all the images within that series appear in the lower half of the panel.

The panel shows up to 8 image previews at a time. If there are more than 8 images in the series, a scrollbar appears on the right to allow you to see the rest of the images.

The image that is currently selected in the Image Viewer is shown with an orange border and a white dot in the upper right corner.

To view an image, press an image preview.

Figure A5-3 Images – Processed panel



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Change Image Display

The Format/Zoom panel (Figure A5-4) controls how many images appear in the Image Viewer screen at one time and adjusts the magnification of each image.

The Zoom buttons change the size of the selected image shown in the Viewer. Table A5-2 describes the Zoom options.

The Display Format buttons allow you to view up to 9 images at one time.

Figure A5-4 Format / Zoom panel

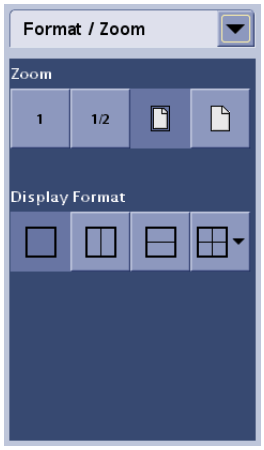

Table A5-2 Zoom tool descriptions

Tool	Description
Zoom One	Shows default the image size where one pixel on the detector equals one pixel on the screen.
Zoom Half	Reduces the image to 50% (four pixels on the detector equals one pixel on screen).
Fit To Screen	Scales the image to fit within the Image Viewer screen.
True Size	Shows the image in the exact size it was acquired from the detector (one centimeter on the detector equals one centimeter on screen).

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Adjust Images

The Image Display Tools panel (Figure A5-5) contains the tools to flip, rotate, adjust brightness, adjust contrast, invert, and apply windowing to the selected image. Table A5-3 describes each tool and how it functions.

Figure A5-5 Image Display Tools panel

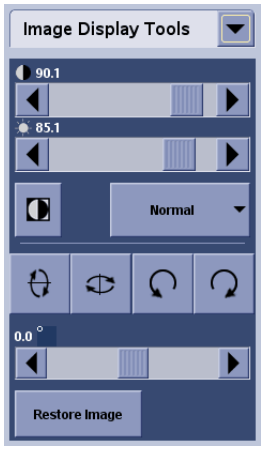

Table A5-3 Image Display Tools descriptions

Tool	Description
Contrast	Adjusts the differences between dark and light on the selected image. • Move the slider right for more contrast (towards pure black and white). • Move the slider left for less contrast (towards uniform gray).
Brightness	Lightens or darkens the selected image. • Move the slider right for a lighter image. • Move the slider left for a darker image.
Invert	Reverses light and dark areas of the selected image.

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Tool	Description
Windowing 	Applies windowing to the selected image. Available options are: • Normal - image as acquired • Hard - adjusts the image towards black and white • Soft - adjusts the image towards gray The GE Portable DR Detectoruses a “Smart Windowing” algorithm to optimize image quality. Smart Windowing is an automated, image-based, and technique-independent method of selecting brightness and contrast for image display. Earlier methods mostly relied on technique information (kVp, dose level, etc.) to set brightness/contrast, making them more prone to operator and system errors.
Vertical Flip	Flips the selected image 180 degrees on the horizontal axis; that is, switches top for bottom.
Horizontal Flip	Flips the selected image 180 degrees on the vertical axis; that is, switches left for right.
Rotate Left	Rotates the selected image counter-clockwise in 90 degree increments.
Rotate Right	Rotates the selected image clockwise in 90 degree increments.
Free Rotation 	Rotates the selected image both clockwise and counter-clockwise. The range is -180° to 180°. • Press the end buttons to rotate the image in 0.1 degree increments. • Press and drag the slider to spin the image. • Move the slider right to rotate the image clockwise. • Move the slider left to rotate the image counter-clockwise.
Restore Image 	Removes all adjustments and returns the selected image to its original state.

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Annotate and Mask Images

The Annotations/Mask panel (Figure A5-6) contains the tools to annotate images. Table A5-4 describes the tools and their functions.

Image annotations are divided into two categories:

- Image annotation – Lines, ellipses, Cobb angle, user annotation (notes), and RL markers added by the operator to measure or bring attention to a section of the image. You draw or place these annotations on the image as appropriate. Refer to Add Image Annotations (p. A5-13) for more information.
- System annotation – Information that is kept by the system, such as identifying information, exposure and acquisition information, and processing information. These annotations are displayed as text at the corners of the image. You may select which annotations appear, but you cannot control where the annotations are placed.

Figure A5-6 Annotations/Mask panel

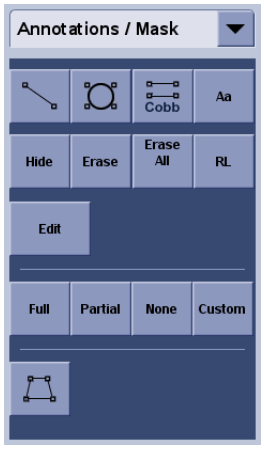
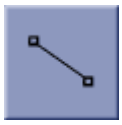
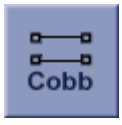


Table A5-4 Annotations/Mask tool descriptions

Tool	Description
Line 	Places a line on the image that you may re-size, move, or angle. Line specifications are shown in the User Measurements annotation at the bottom right corner of the image.
Ellipse	Places an ellipse (circle or oval) on the image that you may re-size, move, or re-shape. Ellipse specifications are shown in the User Measurements annotation at the bottom right corner of the image.
Cobb 	Places a Cobb angle (two lines) on the image that you may re-size, move, or angle. Cobb angle specifications are shown in the User Measurements annotation at the bottom right corner of the image.

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Tool	Description
User Annotation	Places a text box on the image that you may add notes into.
Hide and Show	Temporarily removes image annotations from the image. When annotations are hidden, the button name changes to [SHOW]. Press [SHOW] to see the annotations.
Erase	Deletes the selected image annotation. **NOTE:** Deleted annotations cannot be recovered.
Erase All	Deletes all image annotations. **NOTE:** Deleted annotations cannot be recovered.
RL	Places a Right or Left marker on the image for reference. **NOTE:** RL markers are only available when the image is open in a live exam. Only one marker may be placed on an image.
Edit	Opens a dialog box to edit or change the selected User Annotation (notes).

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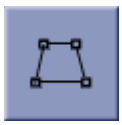
Tool	Description
Full	Places all available system annotation on the image. • Patient information (top left corner) exam date and patient identification • Study information (top left corner) exam identification • Series information (top left corner) series identification • Image information (top left corner) image identification • Acquisition information (top right corner) dose • Hospital information (top right corner) the name of the facility where the image was acquired • X-ray parameters (top right corner) the mA, kVp, ms, mAs, and DEI of the exposure • Anatomy information (bottom left corner) the protocol used to acquire the image • Processing information (bottom left corner) the look used to process the image • User measurements (bottom right corner) size and angle measurements for line, ellipse, and Cobb annotations Display parameters (bottom right corner) the size of the image and the zoom
Partial	Displays ONLY the facility name, dose information and technical factors.
None	Removes all system annotations from the image. System annotations can be re-applied by pressing [FULL], [PARTIAL], or [CUSTOM].
Custom	Brings up a screen (Figure A5-7) that allows you to choose which system annotations appear. Refer to Customize System Annotations (p. A5-12).
Manual Shutter 	Manually adjusts the image shutter. Collimation is detected using image-based processing. In some cases, the FOV detected by the system does not match the actual exposed FOV. Use the Manual Shutter tool to correct this. **NOTE:** This function is only available when the image is open in a live exam or for re-processed images. Refer to Adjust Image Shutter (Crop Image) (p. A5-15) for more information.

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Customize System Annotations

Follow this process to customize the system annotations that appear on the image.

1. Select the Annotations/Mask panel, if necessary.
2. Press [CUSTOM].
   - The Annotation screen (Figure A5-7) appears.

Figure A5-7 Custom Annotation selections

3. Select (check) the annotations you want to appear.
4. Adjust the Font Size, if necessary.
   - The available font sizes are:
     - -2 (smallest)
     - -1
     - N (normal)
     - +1
     - +2
     - +3 (largest)
5. Press [OK].
   - [CANCEL] closes the screen and leaves the selections unchanged.

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Add Image Annotations

NOTE: All image annotations initially appear in the same place (center of image) and are the same shape, size, and/or angle. It is possible to have multiple annotations of the same kind stacked on top of each other.

Follow this process to add image annotations.

1. Select the image to annotate, if necessary.
2. Press the button of the annotation to insert.

NOTE: Selected image annotations are yellow with red handles. Unselected image annotations are aqua without handles.

3. Move, re-size, or change the angle of the annotation as described in Table A5-5.

NOTE: When resizing annotations, make sure that the pointer arrow is inside the square handle and has changed to a "+" sign (Figure A5-8) before trying to move the handle.

Figure A5-8 Active annotation handle

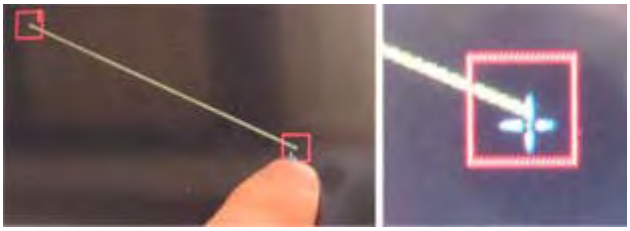
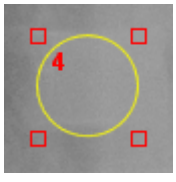


Table A5-5 Image annotation instructions

Tool	Instructions
Line	Select the line. • To move: Press and drag the middle of the line. • To change the angle: Press and drag one of the square handles at the ends of the line. • To resize: Press and drag one of the square handles at the ends of the line.
Ellipse 	Select the ellipse. • To move: Press and drag the ellipse by its edge (not on a handle). • To change shape or re-size: Press and drag a square handle.

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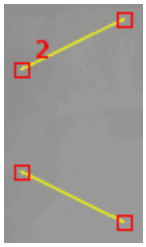
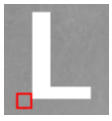
Tool	Instructions
Cobb 	Select the Cobb. • To move: Press and drag the middle of a line. • To change the angle: Press and drag one of the square handles at the ends of the line. • To resize: Press and drag one of the square handles at the ends of the line.
User Annotation	Select User Annotation from the Image Tools palette. Select an annotation from the list or click in the "CUSTOM" text area of the Text Annotation screen. Type your comment. Press [OK]. • To move: Press and drag by the red square on the top left corner of the text box. • To edit: Double-tap (two touches in quick succession) the User Annotation. Make your changes on the Text Annotation screen. Refer to Chapter A7: Set Preferences-Preset Names (p. A7-15) for more information about configuring the pre-set annotation list.
RL Marker 	Select the RL marker. • To move: Select the marker and drag to the desired area. • To switch between R and L: Press the RL button. **NOTE:** Only one RL marker is inserted per image.

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Delete Image Annotations

Follow this process to remove image annotations.

NOTE: It is not possible to recover deleted annotations.

1. Select the annotation.
2. Press [ERASE] or [ERASE ALL].
   - If [ERASE ALL] was pressed, a message appears: "Would you like to remove all annotations from the selected image?"
3. Press [YES].
   - All annotations are removed.

Adjust Image Shutter (Crop Image)

The system has the ability to detect the collimated edges of the image and may apply shutters to mask the collimated areas. Refer to Automatic Shutter (p. A5-16) for more information.

The Manual Shutter function allows you adjust the automatically applied (default) shutter for viewing and printing.

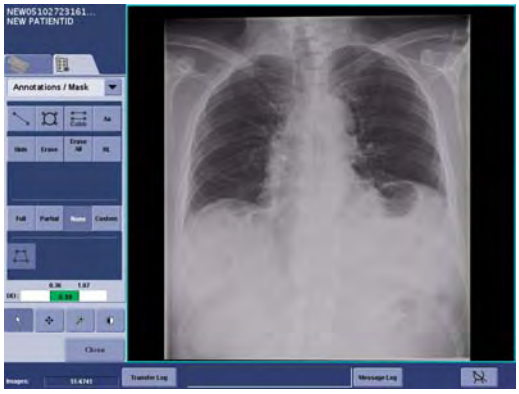
You can only adjust the shutter of images in an active exam or of re-processed images.

NOTE: To view hidden areas of the image, use the Manual Shutter and drag the red corner handles to the edges of the image.

Follow this process to adjust the shutter of an image.

1. Select the image.

Figure A5-9 Image before adjusting shutter



2. Click [MANUAL SHUTTER].
   - The image will be shown in reduced size so that you are able to see the edges (Figure A5-10).
   - The shutter appears as a yellow box with red handles (Figure A5-11). Anything outside of the box will be blacked out when the shutter is applied.

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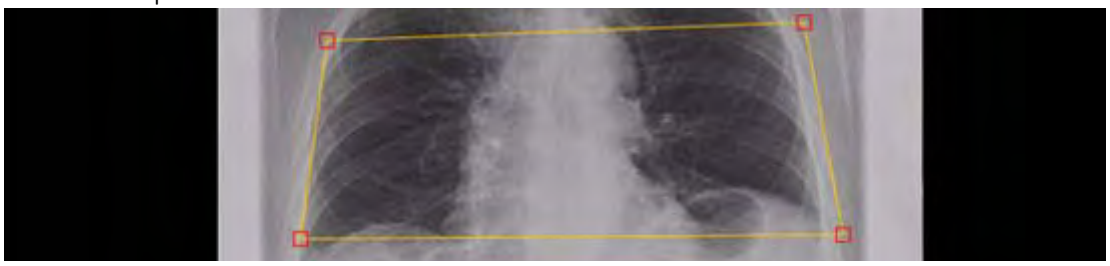
Figure A5-10 Editing the manual shutter

Figure A5-11 Close up of manual shutter



3. Click and drag the red corner handles to the desired shape and size.

NOTE: Any image annotations (line, Cobb, ellipse, R/L marker) that are outside of the visible image area will be lost when the exam is closed. Make sure that annotations are within the active image area. Manual shutters do not effect system annotations.

4. Click [MANUAL SHUTTER] to apply the adjustment.

   - If the image does not return to its selected size, click the Zoom buttons on the Viewer Display panel to re-select the viewing size. Refer to Change Image Display (p. A5-6) for more information.

Figure A5-12 Image after adjusting shutter

5. Click [MANUAL SHUTTER] again to edit.

Automatic Shutter

The Intelligent Collimator Edge Detection (ICED) algorithm relies solely on image information in order to locate any collimation edges present in an x-ray radiograph. This allows the system to provide a shuttered image on the viewer regardless of where the collimated image edges lie on the detector.

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In the event of incorrect automatic shuttering, the image can be recovered by manually re-shuttering the image to visualize the desired anatomy and then re-processing with the same look.

Re-process Images

Image re-processing allows the system to extract more information from an already acquired image by changing the processing settings instead of taking additional exposures.

Re-processing can be performed on any image that has a corresponding raw data set. Images can be re-processed both in live exams and in review mode.

Re-processing creates a new image in the "PROCESSED" series.

NOTE: When closing an exam or closing patient in review mode, you must select to save changes to images or the re-processed images will not remain in the series. Refer to Save Changes to Images (p. A5-27) for more information.

The initial image processing is determined by the default that is configured for the protocol. Refer to Chapter A7: Set Preferences-Image Processing (p. A7-31) for more information.

Table A5-6 describes the settings used to re-process an image.

Figure A5-13 Reprocessing panel

Table A5-6 Reprocessing tool descriptions

Function	Description
Anatomy	Changes the anatomical region.
View	Changes the view.
Image Type	Displays the image type of the acquisition. Images cannot be re-processed with a different image type than originally acquired.
Patient size	Changes the patient size.

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Function	Description
Look	Changes the processing look. Looks are the way an image is processed to be viewed by a radiologist for interpretation. Looks are pre-defined combinations of brightness, contrast, edge enhancement, and tissue equalization. Factory Look descriptions: • Factory Look 1 – similar to analog film, low edge, no TE • Factory Look 2 – low CR look, low edge, moderate tissue contrast • Factory Look 3 – moderate CR look, low edge, TE • Factory Look 4 – highly digital look, high edge, high TE • Custom looks – The system allows you to build up to 5 custom looks in any combination of parameters. Refer to Chapter A7: Set Preferences-Image Processing (p. A7-31) for more information on building custom looks.
[REPROCESS]	Applies the changes and re-processes the image. Re-processing creates a new image in the series. **NOTE:** The button does not become enabled until the Look is selected.
[EDIT PROC]	Brings up a screen that allows you to view the Factory look settings or create custom looks. Refer to Chapter A7: Set Preferences-Image Processing (p. A7-31) for more information about building custom looks.

Determine if Images should be Retaken (DEI)

The Detector Exposure Index (DEI) provides a visual indicator to the user for the amount of exposure received by the detector for a given image. It is designed as a tool for the user to be able to obtain a properly exposed image by altering acquisition parameters in the event of a retake. DEI estimates the dose that has reached the detector and compares it to the expected dose for the anatomy to indicate if the image is under- or over-exposed.

With film cassettes, exposure is directly related to the resulting image; films that are under-exposed or over-exposed will be either too light or too dark. With the DR Detector, dynamic range detection algorithms compensate for exposure errors to create images with acceptable brightness and contrast. Because there is no visible relationship between the actual exposure and the image quality, DEI is used to identify and track under- and over-exposure.

The DEI acceptable range varies by anatomy. For example, a chest PA exposure may result in a DEI of 0.6 while a hand exposure may result in a DEI value of 1.0.

The display of the Detector Exposure Index and the DEI ranges are configured from the Image Viewer preferences screen. Refer to Chapter A7: Set Preferences-DEI (Detector Exposure Index) (p. A7-28) for more information.

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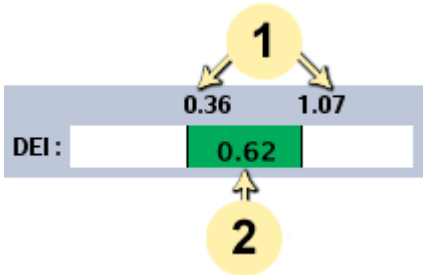
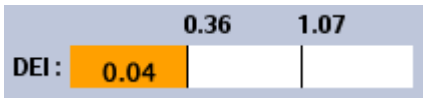
Figure A5-14 DEI graphical display



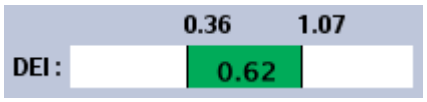
1. Acceptable DEI range (upper and lower limit)
2. Current DEI for the selected image

Figure A5-15 Examples of graphical DEI displays



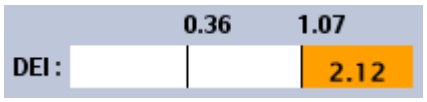
First segment (left) colored orange

Low DEI = Image under-exposed



Center segment colored green

Acceptable DEI = Image correctly exposed



Last segment (right) colored orange

High DEI = Image over-exposed

For each acquired image, the system provides 3 estimated values:

- Uncompensated Detector Exposure (UDExp): Estimated exposure (µGy) to the detector behind the patient anatomy with an assumed technique of 80 kV with no anti-scatter grid. This information is stored in the DICOM header.
- Compensated Detector Exposure (CDExp): Estimated exposure (µGy) to the detector behind the patient anatomy with the actual kV and use of anti-scatter grid. This information is stored in the DICOM header.
- Detector Exposure Index (DEI): A relative measure of exposure to the detector, as compared to the expected exposure for a particular anatomical view. It is a visual indicator on the viewer display.

DEI compensates for the speed setting of the system. For example, if an exposure is taken of an object at a speed setting of 400 and the resultant DEI was 1.72, then an exposure taken of the same object (assuming identical technique and positioning) after setting the speed to 200 will also give a DEI of 1.72.

NOTE: A higher DEI indicates a higher exposure to the detector. It should not be confused with system "speed" which decreases as the exposure increases.

Default DEI lower and upper limits are provided as preliminary guidelines. These guidelines should not be taken as strict requirements of retakes/re-exposures. DEI read-outs are reference guides to help the technologist determine that if a re-acquisition of an image is necessary, the indicator can help the user determine appropriate technique adjustments to provide adequate exposure to the detector.

The specific limits and retake rules should be ultimately determined by the appropriate staff at your facility.

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Corrective Actions

Do the following if both the DEI value is outside of the acceptable range and the image quality is poor:

- Low DEI - increase the mAs and kV values. Increase mAs by increments of 2 Renard steps and check that kVp range is anatomically appropriate.
- High DEI - decrease the mAs and kV values. Decrease mAs by increments of 2 Renard steps and check that kVp range is anatomically appropriate.

NOTE: A 2-Renard step adjustment is equivalent to a 25% change. The amount of change will depend on how high or low the DEI reading is. If the DEI is twice the recommended range, then the initial adjustment should be to cut the mAs in half in order to create a noticeable change in the mAs delivered to the detector and thus change in the DEI readout in subsequent exposures.

If DEI is within the acceptable range but the image quality is still poor, the image may need adjustment through looks customization. Refer to Re-process Images (p. A5-17) to correct individual images or Chapter A7: Set Preferences-Image Processing (p. A7-31) to change the default processing for exams and views.

NOTE: Call for service if the system continues to show low or high DEI. Recurring DEI errors may indicate that the system needs calibration or repair.

Exceptions to Corrective Actions

The following conditions may achieve a properly exposed image but still result in a low DEI. These should be treated as special cases and the standard retake and corrective action rules may not apply.

- The presence of external patient shielding (i.e., lead apron) in the field of view can result in an unexpectedly low DEI (and UDExp/CDExp). The presence of shielding can be easily confirmed by viewing the image.
- The incorrect determination of the FOV by the system can result in an unexpectedly low DEI (and UDExp/CDExp). The presence of significant collimation regions in the final image can be easily confirmed by viewing the image. Correcting the FOV using the Manual Shutter feature does NOT correct the DEI value.

NOTE: User must select the appropriate FOV for the anatomy imaged, and use proper collimation at all times.

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Change Pointer Controls

The pointer control buttons (Figure A5-16) change the action of the pointer when it is pressed and dragged on an image.

Figure A5-16 Pointer control buttons

The pointer controls allow you to perform other functions that are not available in any other tool panel.

Follow this process to change the pointer controls. Table A5-7 describes the action of each control.

1. Select the image to act upon, if necessary.
2. Press the pointer control to use.
3. Press and drag the pointer on the selected image.

Table A5-7 Pointer Controls description

Tool	Description
Select Image	When viewing multiple images, selects the image to act upon. This is the default pointer behavior.
Pan Image	Moves the image within the viewing area.
Image Magnifying Glass	Shows a small part of the image at 3 times magnification.
Change Image Brightness / Contrast	Changes the brightness and contrast by dragging the pointer instead of using the Image Display Tools controls. • Contrast: Press and drag the pointer vertically. Up is more contrast, down is less contrast. • Brightness: Press and drag the pointer horizontally. Right is brighter, left is darker Moving the pointer diagonally will change both brightness and contrast in proportion to the angle of movement. That is, if you move the pointer at a perfect 45° angle, brightness and contrast will change equally; however, if you move the pointer at a 20° angle (more horizontally) the brightness will change more than the contrast.

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Apply Quality Check Indicator (Auto Tag)

If Auto Tag is enabled, the quality check symbol indicates that an image is of acceptable quality and allows the image to be auto printed and auto pushed (if enabled). Refer to Chapter A7: Set Preferences-Auto Tag (Quality Check) (p. A7-19) to enable Auto Tag.

The quality check indicator is a "T" that appears in a white box at the bottom right corner of the image (Figure A5-17). The quality check indicator is on by default. Removing the indicator means that the image is not acceptable and will not be auto printed or auto pushed and will remain on the local database only.

NOTE: The quality check indicator is only available in live exams.

- To remove the quality check indicator, press the white box so that the "T" disappears.
- To restore the quality check indicator, press the white box so that the "T" reappears.

Figure A5-17 Quality check indicator

Print Images

Images can be printed from the system in two ways: Manual Print and Auto Print.

Auto Print

The system can be configured to perform an automatic print upon closure of the exam. Preferences are accessed from the Utilities screen. Refer to Chapter A7: Set Preferences-Auto Print (p. A7-19) for information on configuring Auto Print.

For mobile units, printing will begin the next time the unit is connected to the network.

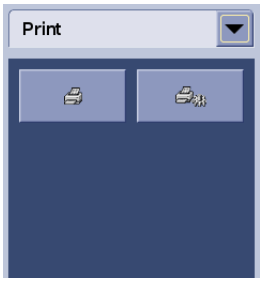
Manual Print

Film Manager and Manual Print allow you to print images on demand.

Mobile units must be connected to the network to be able to print.

- Film Manager allows configuration and printing of multiple images in a series.
- Manual Print allows configuration and printing of the currently selected image.

Figure A5-18 Print panel



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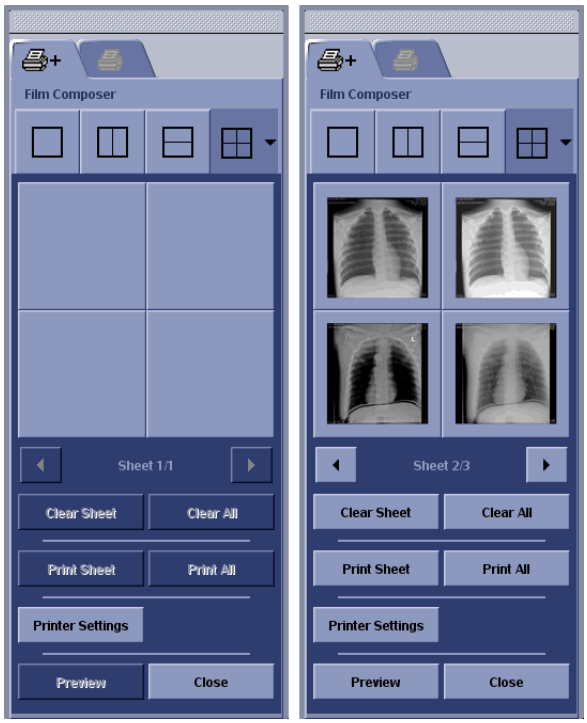
Print Multiple Images

Follow this process to print multiple images.

1. Press [FILM MANGER].
   - The Film Composer screen (Figure A5-19) appears.

Figure A5-19 Film Composer screen - before and after images are added

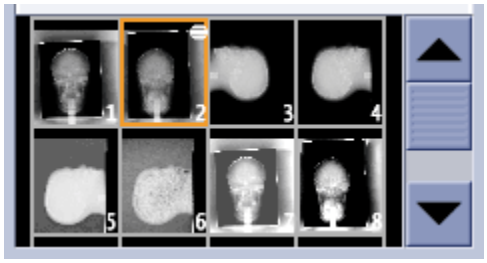


2. Select the number of images you want to appear on a sheet.
   - If there are more images in the series than will fit on the sheet, use the Sheet [◂] and [▸] buttons to configure the printing options for each sheet.

NOTE: You are able to change the number of images for each sheet individually; however, changing the format will remove any images that already exist on the sheet.

3. Drag the image thumbnails from the Images - Raw or Images - Processed panel (Figure A5-20) to the Film Composer screen.

Figure A5-20 Images - Processed panel



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4. Use the buttons to confirm and adjust the print settings.
   - Press [PREVIEW] to see how the images are positioned on the sheet.
   - Press [CLEAR SHEET] to remove images from the currently displayed sheet.
   - Press [CLEAR ALL] to remove images from all sheets.
   - Press [PRINT SHEET] to print the currently displayed sheet.
   - Press [PRINT ALL] to print all sheets.
5. Press [PRINTER SETTINGS] to confirm or adjust the printer configuration. (Refer to Figure A5-22 and Table A5-8 for more information.)
6. Press [CLOSE] when finished.

Print Current Image

Follow this process to print a single image.

1. Select the image from the Images tool palette, if necessary.
2. Press [MANUAL PRINT].
   - The Print Images screen appears.
3. Adjust the settings as indicated in Table A5-8.
4. Press [PREVIEW] to confirm that the image placement is correct.
   - If the image placement is incorrect (as shown in Figure A5-21), press [CANCEL] to return to the Print Images screen and adjust the settings.
   - If the image placement is acceptable, press [PRINT] to print the image.

Figure A5-21 Example of Print Preview with incorrect settings

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5. Press [PRINT] to print the image.
   - [CANCEL] closes the Print Images screen without printing and returns you to the Image Viewer screen.

Figure A5-22 Print Images screen

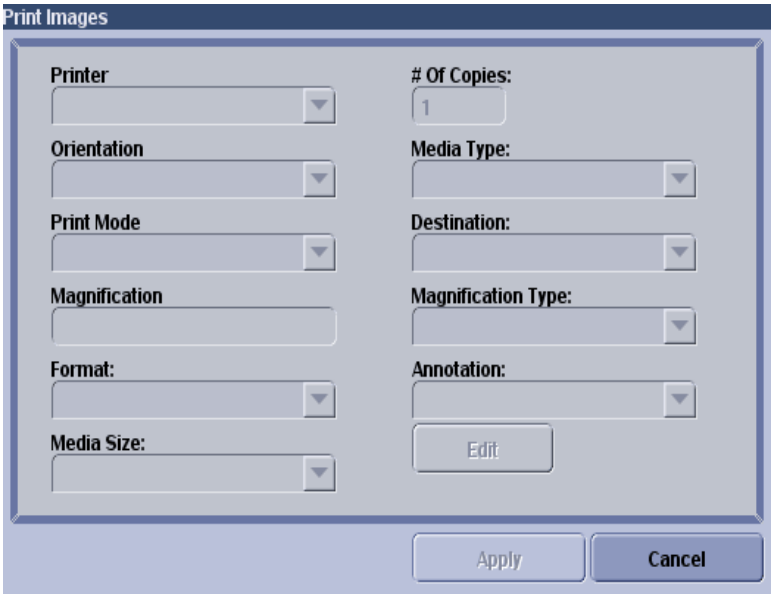

Table A5-8 Print Images field description

Field	Description
Printer	Lists all available printers configured for your system.
Orientation	Selects vertical or horizontal orientation of the image on film or paper. Available options are: • Landscape • Portrait
Print Mode	Selects what size to print the image. Available options are: • True Size • Fit to Film • Reduce Size • Orthopedic Magnification (if enabled)
Magnification	If Reduce Size is selected as the Print Mode, allows you to enter the percent by which the image will be reduced. The accepted range is between 40% and 90%. If True Size or Fit to Film are selected as the Print Mode, the text box remains disabled.

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Field	Description
Format	Selects the print format. Available options are: • Standard • 35 mm • 40 mm
Media Size	Shows the available sizes that are configured for the selected printer.
# of Copies	Defines how many copies to print.
Media Type	Selects the type of media to print on. Available options are: • Paper • Clear film • Blue film
Destination	Selects the destination. Available options are: • Processor • Magazine
Magnification Type	Selects the magnification type. Available options are: • Cubic • None
Annotation	Selects the amount of annotation to print on the image. Available options are: • Full • Partial • Custom • None Refer to Annotate and Mask Images (p. A5-9) for more information.
[EDIT]	If Custom Annotation was selected, brings up a screen that allows you to choose the annotation to print on the image. Refer to Annotate and Mask Images (p. A5-9) for more information.
[PREVIEW]	Shows how the image will appear on the film or paper with the current settings.
[PRINT]	Prints the image.
[CANCEL]	Cancels printing.

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Send Images

If Auto Send is enabled, acquired images are automatically sent to a pre-determined location on exam close. Refer to Chapter A7: Set Preferences-Auto Send (Auto Push) (p. A7-22) for information on configuring Auto Send.

For mobile units, Auto Send will begin the next time the unit is connected to the network.

Save Changes to Images

You have the option to save or discard the changes you have made to images when you close the Image Viewer screen or end the exam.

1. If in a live exam, press [CLOSE] on the Acquisition screen.
2. If in review mode, press [CLOSE] on the Image Viewer screen.
   - A message appears: “Would you like to save the changes made to the images?”
3. Press [YES].
   - [NO] closes the Image Viewer screen without saving changes.

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Chapter A6: Image Management

The Image Management screen (Figure A6-1) shows all the images stored in the selected database source. This screen is used to manage images, copy images to exams, transfer images to network hosts, or save images on CD.

Topics covered include:

- Overview (p. A6-1)
- View Patient Information (p. A6-7)
- Load Images from a CD (p. A6-7)
- Synchronize to HIS or RIS or PACS (p. A6-8)
- Search List (p. A6-8)
- Open Exams and Images (p. A6-9)
- Copy Exams and Images (p. A6-9)
  - Copy Exams to a Network Host (p. A6-9)
  - Copy Images to Another Exam (p. A6-10)
  - Copy Exams to a CD (p. A6-12)
- Delete Exams, Series, or Images (p. A6-13)
  - Lock Exams from Deletion (p. A6-14)
- Make Exam Anonymous (De-Identify) (p. A6-14)

Overview

The majority of the Image Management screen is devoted to the exam list. Images are organized by exam. Each exam is a row. If multiple exams were acquired in the same session, each exam has its own row on the list. The exam expands to show the series.

Within each exam are “series” of images. A series is a collection of one or more images acquired in a session. Each protocol is a series. A new series is created when a completed exam is appended.

There are two types of image series: raw and processed. Raw images are the exact images that were acquired. Processed images are the raw images with specific processing and image adjustments (such as brightness and contrast) applied. It is possible to create several processed images from one raw image.

Individual images reside within the series. Pressing a series or pressing the [+] button opens the image details section of the Image Management screen. In the Image Details section, each row is an image. Selecting a row makes a small preview image, or “thumbnail,” appear. The image may be opened for viewing, adjustment, or deletion.

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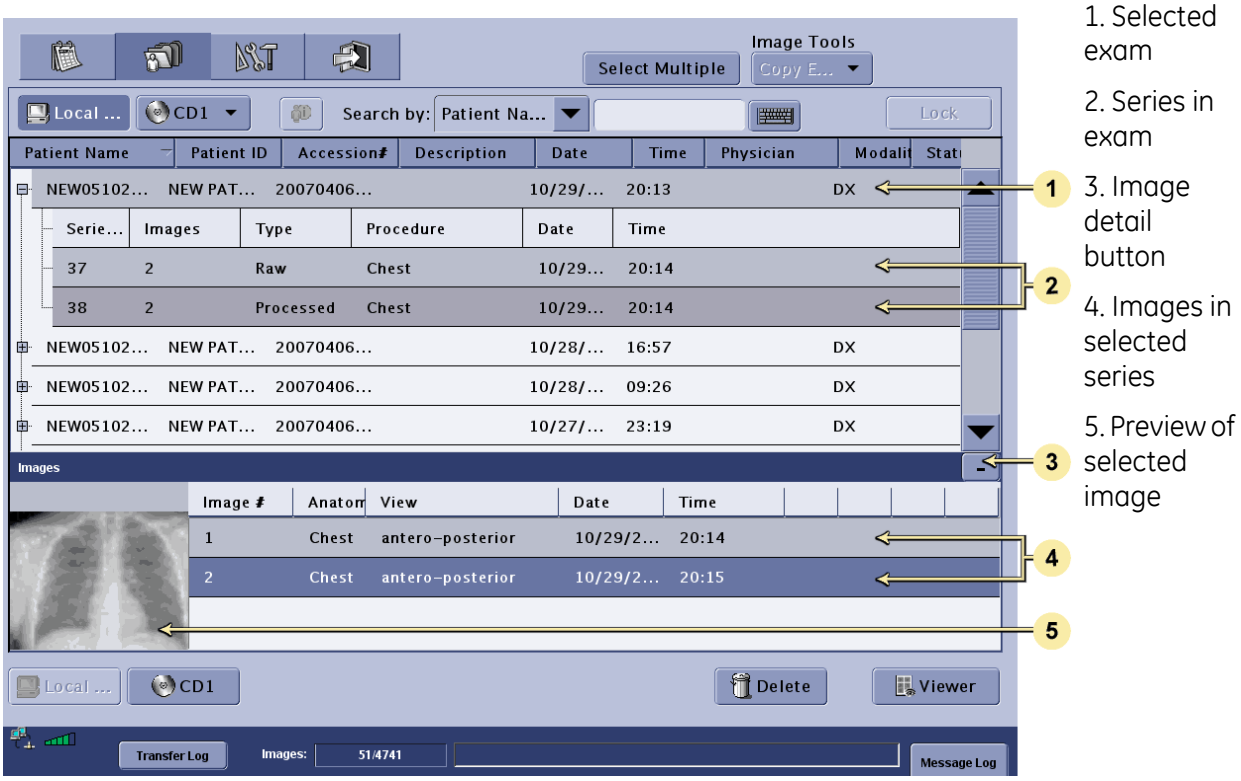
Selecting multiple exams on the Image Management screen is different than on the Worklist. The Image Management screen allows you to select exams that do not have the same Patient ID or Patient Name. To select multiple exams, press the [SELECT MULTIPLE] button, then select the exams. The [SELECT MULTIPLE] button will remain engaged until an action (such as Copy Exam or Transfer) is completed, then the button will automatically disengage.

Figure A6-1 Image Management screen



1. Selected exam
2. Series in exam
3. Image detail button
4. Images in selected series
5. Preview of selected image

Table A6-1 Image Management screen functions

Function	Description
navigation bar	Allows you to change between the Worklist, Image Management, and Utilities screens or allows you to logoff the system (if applicable). The darker color indicates which screen is currently displayed. The individual buttons are described below.
[WORKLIST]	Opens the Worklist screen where patient procedures may be added to the schedule and exams started. Refer to Chapter A3: Worklist for more information.

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Function	Description
[IMAGE MANAGEMENT]	Opens the Image Management screen where images may be selected for viewing or be copied to other exams.
[UTILITIES]	Opens a screen where system settings (such as Network and Printer connections) and preferences may be changed. If the Login function is enabled, the preferences you are allowed to change will vary depending on your level of access. Refer to Chapter A7: Set Preferences for more information.
[LOG OFF]	If the Login function is enabled, pressing this button logs the current user off of the system. Refer to Chapter A2: General Information-Login and Log off (p. A2-5) for more information.
[SELECT MULTIPLE]	Allows systems with touch screens to select multiple exams to transfer, copy to CD, or delete. **NOTE:** This button only allows the selection of multiple exams and images, not series. **CAUTION:** **If both exam and images are selected, the exam will be deleted upon confirmation.**

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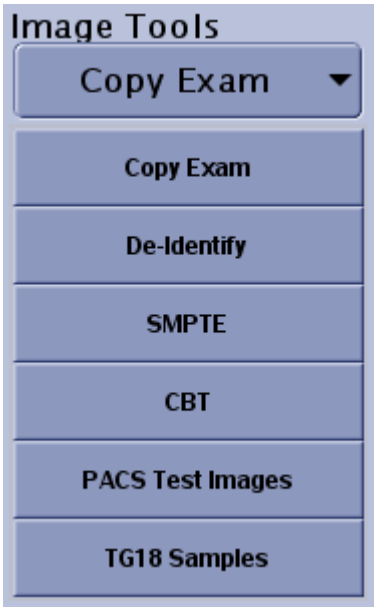
Function	Description
Image Tools 	Performs various functions on selected exams. Available options are: • Copy Exam – Allows all exam images for a patient to be copied to another patient, to another location, or to CD. Refer to Copy Exams and Images (p. A6-9) for more information. • De-identify – Makes the exam anonymous (removes all patient identifying information, including Name, ID, and accession number). Refer to Make Exam Anonymous (De-Identify) (p. A6-14) for more information. • SMPTE – Allows services personnel to access the SMPTE pattern for system calibration. • CBT – If available, launches Computer Based Training for the system. If Computer Based Training is not available, the option is disabled ("grayed out"). • PACS Test Images – Loads a set of calibration images that are used to test the quality of images sent to PACS or printers. • TG18 Samples – Loads a set of test images that are used to calibrate the display monitor. **NOTE:** It is not expected that you will need to access the SMPTE pattern or test images during the course of normal work. Test images are used to calibrate the system or to determine the cause of image quality problems.
source locations 	Selects the source of images to view (e.g., the local unit or a CD). Refer to Open Exams and Images (p. A6-9) for more information.
[PATIENT INFORMATION] 	Shows the Patient Information screen for the selected procedure. **NOTE:** Patient Information cannot be edited once an exam has started. Refer to Chapter A3: Worklist-Add / Edit Patient Information (p. A3-15) for more information.
Search by 	Searches for exams by sorting the selected the column (shown in the drop-down list) and searches for text entered into the text box. Refer to Search List (p. A6-8) for more information.
[LOCK] or [UNLOCK] 	Locks the selected exams from deletion. If a locked exam is selected, the button name changes to [UNLOCK]. [UNLOCK] removes the lock from the selected exams. Refer to Lock Exams from Deletion (p. A6-14) for more information.

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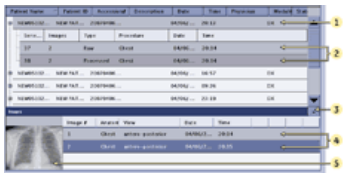
Function	Description
Exam, series, and images list 	Lists the images saved in the local database categorized by exams and series. The following information is displayed: • Exams - the exams saved in the local database • Series detail - the series for the selected exam • Image list - the images for the selected series • Image preview - a representative thumbnail of the selected image. Figure A6-1 shows how the information is organized.
Destination	Selects where images are to be copied or saved. The first button switches between the local unit and any configured network hosts. **NOTE:** If the GE Portable DR Detector is used in a mobile unit, network hosts will only be available when the unit is connected to the network. **NOTE:** For mobile units, the [CD1] button is only available if the unit's external CD drive is connected. Refer to Copy Exams and Images (p. A6-9) for more information.
[DELETE]	Deletes the selected exams, series, or images from the local database. Refer to Delete Exams, Series, or Images (p. A6-13) for more information.
[VIEWER]	Opens the Image Viewer screen and shows the images in the selected series. Images may be adjusted on the Image Viewer screen. Refer to Chapter A5: Image Viewer for more information.
network connection status	Appears when the Definium AMX 700is connected to the hospital network.
wireless network connection status	If the wireless network connection is enabled, displays the status of the connection and signal strength. Refer to Chapter A2: General Information-Wireless Network Connection (p. A2-7) for more information.
[TRANSFER LOG]	Shows a list of transferred exams and their destinations. Refer to Copy Exams and Images (p. A6-9) for more information.

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Function	Description
database size 	Shows how many images are currently saved to the local database and approximately how many more images the database is able to accommodate. Refer to the following sections for more information: • Copy Exams and Images (p. A6-9) to save images to another database or disk • Delete Exams, Series, or Images (p. A6-13) to remove images
system status 	Displays the last system status message. Refer to Chapter A2: General Information-System Status and Messages (p. A2-10) for more information.
[MESSAGE LOG] 	Displays the message log since the last system re-start. Refer to Chapter A2: General Information-System Status and Messages (p. A2-10) for more information.

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View Patient Information

When accessed from the Image Management screen, the Patient Information screen displays exam information about the acquired images in the lower left corner (Figure A6-2). All other patient information is as described in Chapter A3: Worklist-Add / Edit Patient Information (p. A3-15).

Figure A6-2 Patient Information from Image Management screen

Load Images from a CD

Follow this process to access images stored on a CD.

1. Connect the external CD R/W drive to the unit.
2. Insert the CD with images into the CD drive.
3. Press Source [CD1].
   - The exam list updates to show the images stored on the CD.
4. Select the exams.
5. Copy the exams to the Local database. Refer to Copy Exams and Images (p. A6-9) for more information.
6. Click the [LOCAL] Destination button.
   - A message appears: "Selected images will be copied to (destination name). Select OK to confirm."
7. Click [OK].
8. Open the exams from the Local database.

NOTE: If the exams are being viewed on a computer that has the DICOM viewer installed, images may be viewed directly from the CD.

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Synchronize to HIS or RIS or PACS

Upon connection to the network, the system will:

- automatically connect to PACS and auto send images (if auto send is enabled)
- automatically connect to printers and print images queued for auto print (if auto print is enabled)

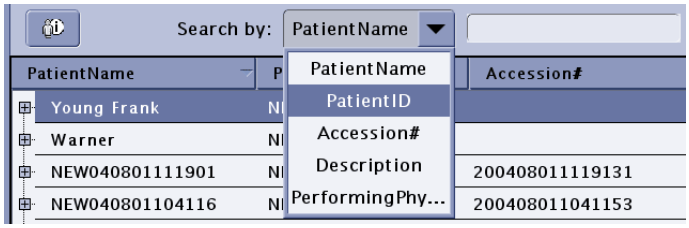
Refer Chapter A7: Set Preferences-Network Connections (p. A7-2) for more information about configuring network and printer connections.

To update the Worklist with HIS or RIS data, press the [REFRESH] button. Refer to Chapter A3: Worklist-Refresh (p. A3-11) for more information.

Search List

The Search feature finds procedures by column.

Figure A6-3 Search by column drop-down list



1. Press the button on the Search By drop-down list to select the column you want to search.
   - If the column you want is already selected, begin at step 3.
2. Select the column. For example, Patient ID.
   - The list automatically sorts the selected column.
3. Type the search criteria into the text box. For example, you are looking for patients whose names begin with "J", so you would type "j" into the text box.

NOTE: The text box is not case sensitive.

4. Continue typing the search criteria.
   - The list automatically selects the first procedure that matches what you have typed into the text box.
   - If no procedures match what you have typed, the list de-selects all procedures and places the closest match at the top of the exam list.

Sort by Column

Sorting allows you to organize the procedures by the column of your choice.

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1. Press on the column heading you want to sort, or choose the column in the Search By drop-down list. For example, you want to see all the procedures that were performed by a specific physician, so you click on the "Performing Physician" column heading.
   - An arrow appears in the column heading to indicate which column is currently being sorted.
2. Press the column heading again to switch between ascending and descending order.
   - An up-pointing arrow indicates that the column is sorted in ascending order. That is, sorted in alphabetical order or numerical order from smallest to largest.
   - A down-pointing arrow indicates that the column is sorted in descending order. That is, sorted in reverse alphabetical order or numerical order from largest to smallest.

Figure A6-4 Column with ascending sort

Open Exams and Images

Follow this process to open exams and images for viewing.

1. Press the [+] button to the left of the exam name to open it.
   - The series for the exam expands below the exam.
2. Press the series to open it (or, select the series and press [+] to see image details).
   - The image detail opens.
3. Select the image.
   - A preview thumbnail appears.
4. Press the image (or, select the image and press [VIEWER]).
   - The selected series opens on the Image Viewer screen with the selected image displayed.

Copy Exams and Images

Exams (including all series and images) may be copied to a network host or to a CD. The images from one exam may be copied to another exam.

NOTE: Copying exams does not remove the exam from its original location.

Copy Exams to a Network Host

Exams may be copied from the local database to a configured network location or vice versa. Exams cannot be copied from one network host to another network host. Refer to Chapter A7: Set Preferences for information about configuring network hosts.

NOTE: If the GE Portable DR Detector is used in a mobile unit, the unit must be connected to the network.

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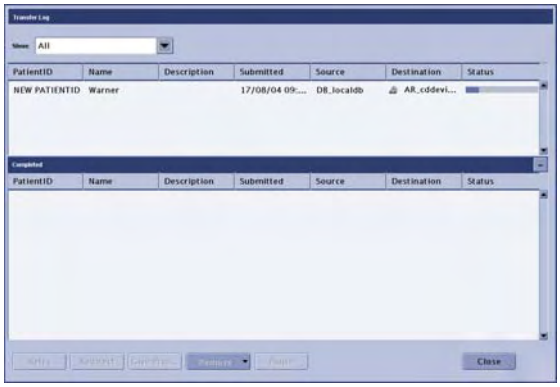
1. Select the exams to copy.
2. Press [DESTINATION].
   - A message appears: “Images will be copied to (host name). Select OK to confirm.”
3. Press [OK].
   - If there is a problem and the exams cannot be copied to the selected network host, a message appears: “The network destination is not responding. If the problem persists contact your network administrator.”
4. Press OK to close the message. Make sure that the unit is properly connected to the network or try copying the exams at a later time.
   - To see the status of the exams being copied, press [TRANSFER LOG] at the bottom of the Image Management screen.
   - The Transfer Log screen (Figure A6-5) appears.
5. Press [CLOSE] to close the screen and return to the Image Management screen.

Figure A6-5 Transfer Log screen



Copy Images to Another Exam

This process is used to copy images from one exam to another. Copying images is used to consolidate images from multiple exams to a single exam and to reconcile patients to exams. For example, images taken for an emergency exam can be assigned to the patient’s real name once the patient’s information is known. Another example is to assign images that were acquired for the wrong Worklist entry to the correct patient.

Images are copied to procedures that appear on the Worklist. Once the copy is complete, the procedure is marked as “Completed” on the Worklist and the new exam appears on the Image Management screen. Images may be copied to procedures with the status of Suspended, Discontinued, or Scheduled. Images may not be copied to procedures with a status of Completed.

NOTE: You can only copy the images from one exam at a time.

NOTE: You cannot copy images to multiple Worklist procedures.

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1. If necessary, create a Worklist procedure entry for the patient with the appropriate information.
   a) On the Worklist screen, click [ADD PATIENT].
   b) Enter the patient's information. Refer to Chapter A3: Worklist-Add / Edit Patient Information (p. A3-15) for more information.
   c) Click [SAVE].
2. On the Image Management screen, select the exam to copy.
3. Switch the [IMAGE TOOLS] button to COPY EXAM, if necessary.
   - The Copy Exam screen appears.

Copy Exam
Select an exam on the worklist to receive the copied images from the benton peter – exam
Search by:
Status
Filter List
Refresh List
Date
Time
Patient Name
Patient ID
Accession#
Physician
Description
Modality
Status
08/02/2005 14:10 coruday, elizabeth NEW PATI... DX SCHEDUL...
08/02/2005 14:09 ross, douglas NEW PATI... DX COMPLE...
08/02/2005 14:09 ross, doug NEW PATI... DX SCHEDUL...
08/02/2005 14:09 romano, robert NEW PATI... DX SCHEDUL...
08/02/2005 14:07 tracey, harper NEW PATI... DX SCHEDUL...
08/02/2005 14:07 greene, mark NEW PATI... DX COMPLE...
08/02/2005 14:06 susan, lewis NEW PATI... DX COMPLE...
08/02/2005 14:06 kerry, weaver NEW PATI... DX SCHEDUL...
08/02/2005 14:06 hathaway, carol NEW PATI... DX SCHEDUL...
08/02/2005 14:05 carter, john NEW PATI... DX SCHEDUL...
08/02/2005 14:05 benton, peter NEW PATI... DX COMPLE...
08/02/2005 14:05 benton, peter NEW PATI... DX SCHEDUL...
OK
Cancel

   - The Copy Exam screen shows all Worklist entries with the status of "Scheduled", "Discontinued", or "Suspended".
4. Search or Filter the exam list to locate the destination exam.
5. Select the exam where you want the images copied to.
6. Press [OK].
   - A message appears: "Images will be copied to the selected exam. Images will not automatically be removed from the source exam. The destination exam will be marked as Completed."
7. Click [OK].
   - The message closes.
   - A message appears: "Copying Images"
   - [CANCEL] stops the copy process, closes the message, and returns you to the Image Management screen.
   - All series and images are copied to the exam.

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Copy Exams to a CD

If your unit has an external CD drive, exams may be copied to a CD for archiving purposes, to send to a location that is not within the network, or to include with a patient's medical records.

NOTE: The CDs used for copying images must be recordable. That is, the CD should be labeled "CD-R" (recordable).

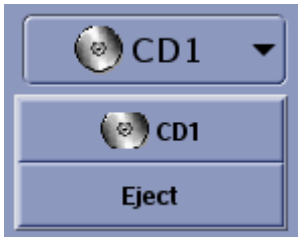
DO NOT use re-writable (CD-RW) disks. The system cannot write to this type of disk.

NOTE: You cannot copy exams to a CD that already has exams or other information saved on it. You will receive a message, "CD is not blank. Please insert a blank CD to proceed" when you attempt to copy images to the CD. Always use a new, blank CD.

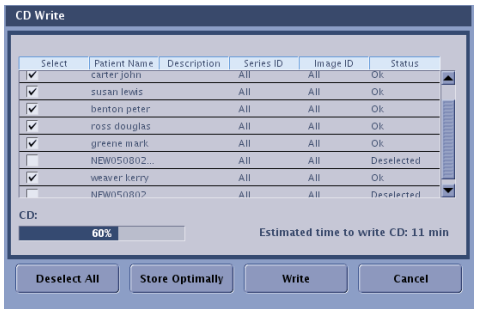
1. Open the CD tray. (Select Eject from the [CD1] drop-down list.)

NOTE: Pressing the Eject button on the workstation PC does not open the CD tray. When working on the Image Management screen, always use the Eject option from the [CD1] drop-down list (Figure A6-6).

Figure A6-6 CD 1 button drop down list



2. Insert a blank CD into the tray.
3. Press Source [CD1] to close the CD tray.
4. Select the exams to copy.
5. Click the **Destination** [CD1].
   - The CD Write screen appears.



   - [DESELECT ALL] unchecks all exams on the list.
   - [STORE OPTIMALLY] determines which exams to copy to best utilize the space on the CD. It will automatically uncheck exams that cannot fit on the CD.
   - [WRITE] begins the copying process.
   - [CANCEL] closes the screen and returns you to the Image Management screen.

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6. Confirm the exams to be copied. Uncheck any exams that you do not want saved to the CD.
7. Press [WRITE].
   - The CD begins copying. The light on the front of the computer flashes yellow as the data is being written.
   - To see the status of the exams being copied, press [TRANSFER LOG] at the bottom of the Image Management screen.
   - The Transfer Log screen appears.
   - Press [CLOSE] to close the screen and return to the Image Management screen.
   - When complete, the CD tray will open and close.
8. After the system finishes the CD, open the exams on the CD to ensure that the CD has the data written to it. Refer to Load Images from a CD (p. A6-7) for more information.
9. Remove the CD.
10. Label the CD and store in a safe place.

Delete Exams, Series, or Images

Exams, series, and images may be deleted from the local database from the Image Management screen.

Follow this process to delete exams, series, and images.

1. Select the **Local** source, if necessary.

NOTE: Items cannot be deleted from a CD or network locations.

2. Unlock exams, if necessary.
   - Refer to Lock Exams from Deletion (p. A6-14) for more information.
3. Select the items to delete.
   - The items may be exams, series with an exam, or images within a series. Multiple items may be selected and deleted at once.
4. Press [DELETE].
   - A message appears: “Are you sure that you would like to delete the selected items?”
5. Press [OK].
   - The message closes.
   - The items are deleted from the Image Management screen.
   - [CANCEL] closes the message and the items remain on the Image Management screen.

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Lock Exams from Deletion

The Image Management screen allows you to prevent, or "lock", exams from being deleted. The exam can only be deleted if the lock is removed, or "unlocked." The lock prevents exams from being deleted by other operators and from Auto Delete. Refer to Chapter A7: Set Preferences-Image Management (p. A7-18) for more information about Auto Delete.

Locked exams can still be copied, transferred, and viewed.

Only exams can be locked. Individual series or images cannot be locked.

Follow this process to lock and unlock exams.

1. Select the exams to lock.
   - Multiple exams may be selected and locked at once.
2. Press [LOCK].
   - The lock icon appears in the status column of all selected exams.

   - The [LOCK] button changes to [UNLOCK].

Unlock Exams

Follow this process to unlock exams so that they may be deleted.

1. Select the locked exams.
   - The Unlock button becomes active.
2. Press [UNLOCK].
   - The lock icon is removed from the status column of the selected exams.
   - The exams may now be deleted.

NOTE: You are able to lock or unlock multiple exams even if the selected exams are a mixture of locked and unlocked. Pressing the [LOCK] button will lock all selected exams. Clicking the button again will unlock all selected exams.

Make Exam Anonymous (De-Identify)

There may be times when you want the name of a patient to be kept confidential to maintain patient privacy. You can do this using the De-Identify feature. This feature allows you to create an anonymous set of images.

The patient examinations are copied and used to create a new patient, with the name "Anonymized patient" and a unique, randomly created Patient ID as shown in Figure A6-8.

NOTE: The original exam is not modified in any way, only a copy is altered.

NOTE: Once an anonymous exam is created, there is no way to recover the patient's identifying information.

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The De-Identify option is available from the Image Tools button (Figure A6-7).

Figure A6-7 Image Tools button

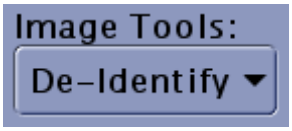
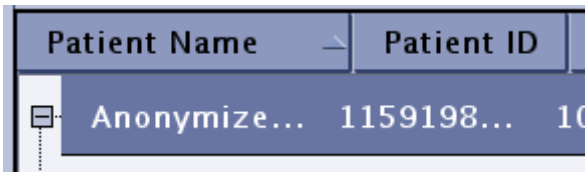


Figure A6-8 Anonymous patient



Use this process to make exam images anonymous:

1. Select the exams to make anonymous.
2. Switch the Image Tools button to [DE-IDENTIFY], if necessary.
   - A message appears: "The selected exams will be copied without patient identification. The originals will not be deleted."
3. Press [OK].
   - The Image Management screen updates with copied, anonymous exams.

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Chapter A7: Set Preferences

Preferences allow a super-user to customize the system. This chapter explains the Preferences available to you and how to activate or change the preferences for your facility, such as:

- Predefine X-ray procedure parameters so that any stored procedure may be retrieved from memory, allowing you to access technique factors programmed for that type of procedure.
- Enable automatic networking and printing features.
- Customize system default annotations and image orientation.
- Create preferences for image processing.
- Save commonly used operator and physician names in your system for later recall.

Topics covered include:

- System (p. A7-2)
  - Network Connections (p. A7-2)
  - Printers (p. A7-7)
- Worklist (p. A7-13)
  - Default Query (p. A7-13)
  - Preset Names (p. A7-15)
- Image Management (p. A7-18)
  - Copy Exam (p. A7-18)
  - Auto Tag (Quality Check) (p. A7-19)
  - Auto Print (p. A7-19)
  - Auto Send (Auto Push) (p. A7-22)
  - Auto Delete (p. A7-23)
- Image Viewer (p. A7-25)
  - Configure Pre-set Annotations (p. A7-25)
- DEI (Detector Exposure Index) (p. A7-28)
- Exam (p. A7-30)
- Image Processing (p. A7-31)
  - Build Custom Looks (p. A7-32)
  - Tissue Equalization Overview (p. A7-36)
- Protocols (p. A7-39)
  - Backup Protocol Database to CD (p. A7-40)
  - Retrieve Protocol Database from CD (p. A7-41)
  - Edit Protocol Database (p. A7-41)
  - Protocol Editor Copy Functions (p. A7-49)

Preferences are set on the Utilities screen (Figure A7-1), which is accessed by pressing the [UTILITIES] button on the Worklist.

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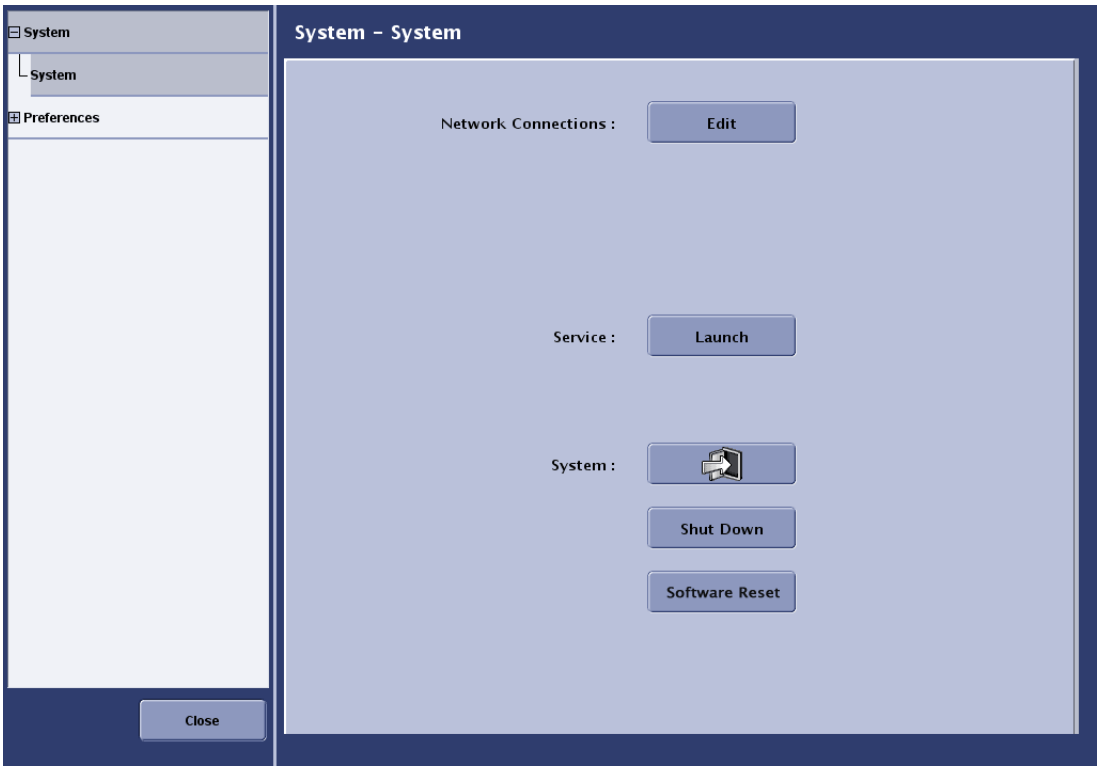
Figure A7-1 System Utilities screen



System

This section provides instructions for setting your system preferences for network and printer connections. The Services Desktop, Log Off, and Shut Down functions are also available from this screen. Refer to Chapter A2: General Information for more information about logging off and Shut Down.

Network Connections

Network and printer connections are configured through the Utilities System-System screen. This screen allows qualified service personnel to define the Digital Imaging and COmmunication in Medicine (DICOM) send destinations.

Network connections may be added, removed, or edited from this screen.

Follow this process to access the Network Connections screen.

1. On the Worklist screen, press [UTILITIES].
   - The System-System screen appears.
2. Press [NETWORK CONNECTIONS].
   - The Network Connections screen (Figure A7-2) appears.

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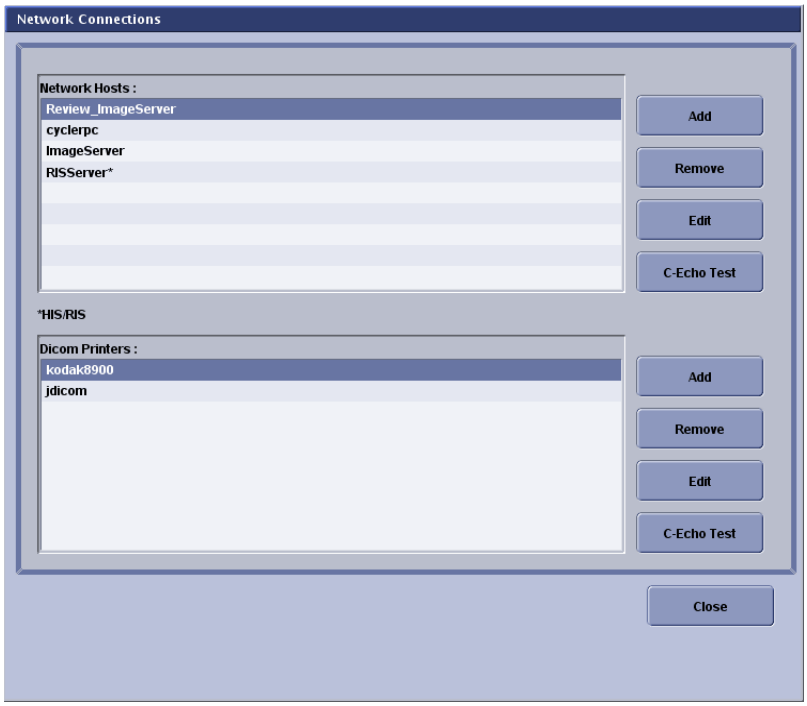
Figure A7-2 Network Connections screen



Add or Edit Network Host

Adding and editing network hosts use very similar process and the same screens as shown in Figure A7-3 and Figure A7-4. Table A7-1 and Table A7-2 describe the fields in detail.

- If editing an existing connection, select the network host and press [EDIT].
- If adding a new connection, press [ADD].

1. Complete requested information for both tabs (see Table A7-1 and Table A7-2) and press [SAVE] to add the network host or save the changes.

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Figure A7-3 Add Network Host – Host tab

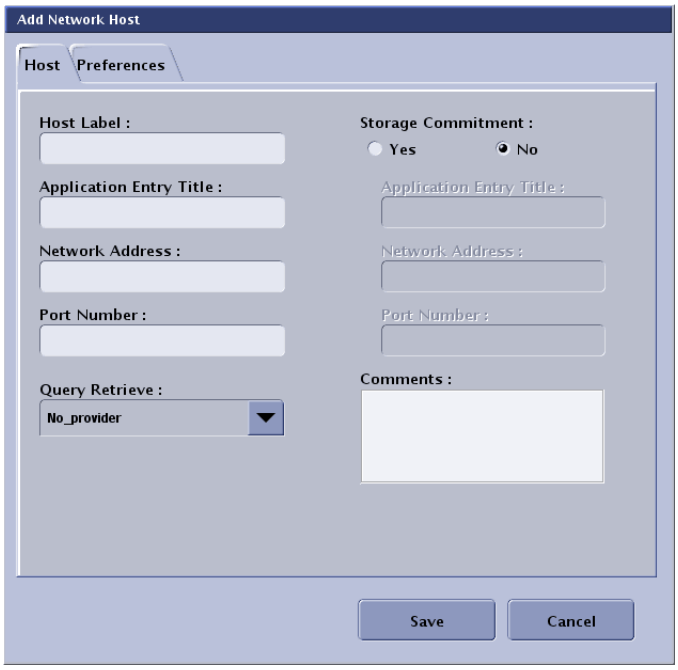

Table A7-1 Add Network Host – Hosts tab description

Function	Description
Host Label	The name of the host that appears in the Network Hosts lists and on the Image Management screen. **NOTE:** Host labels cannot have spaces in the name. Use underscores (_) to separate words.
Application Entry Title	The DICOM application title.
IP Address	The IP address of the network host.
Port Number	The port number for the network host.
Query Retrieve	Sets the type of information the host will provide on query from another host. Available options are: • No provider • Study • Patient
Storage Commitment	Designates if the host will store image data.
Storage Commitment - Application Entry Title	The DICOM application title.

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Function	Description
Storage Commitment - Network Address	The IP address of the storage database.
Storage Commitment - Port Number	The port number of the storage database.
Comments	Allows you to add notes about the network host or configuration.

Figure A7-4 Add Network Host – Preferences tab

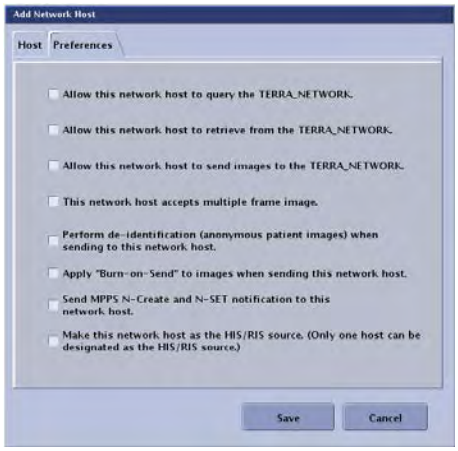
Add Network Host
Host
Preferences
Allow this network host to query the TERRA_NETWORK.
Allow this network host to retrieve from the TERRA_NETWORK.
Allow this network host to send images to the TERRA_NETWORK.
This network host accepts multiple frame image.
Perform de-identification (anonymous patient images) when sending to this network host.
Apply "Burn-on-Send" to images when sending this network host.
Send MPPS N-Create and N-SET notification to this network host.
Make this network host as the HIS/RIS source. (Only one host can be designated as the HIS/RIS source.)
Save
Cancel

Table A7-2 Add Network Host – Preferences tab description

Function	Description
Allow this host to query the (GE Portable DR Detector system name)	Allows this host to search and filter the GE Portable DR Detectorsystem.
Allow this host to retrieve from the (GE Portable DR Detector system name)	Allows this host to open and display exams from the GE Portable DR Detectorsystem.
Allow this host to send images to the (GE Portable DR Detector system name)	Allows the host to send images to the GE Portable DR Detectorsystem.
This network host accepts multiple frame image.	Allows multiple frame images to be send to this network host.
Perform de-identification (anonymous patient images) when sending to this network host.	Automatically de-identifies any images that the GE Portable DR Detector system sends to this host. Refer to Chapter A6: Image Management-Make Exam Anonymous (De-Identify) (p. A6-14) for more information about de-identification.

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Function	Description
Apply "Burn-On-Send" to images when sending to this network host.	Burns the VOI LUT (Look-Up Tables) into the DICOM header to be displayed by PACS. Leaving his option unselected sends all available VOI LUTs to the DICOM header for PACS to query and apply. **NOTE:** PACS should be configured to read the first VOI LUT for proper display of images on the Acquisition workstation.
Send MPPS N-Create and N-Set notification to this network host.	This node acts as the Destination for receiving the MPPS N-Create & N-Set Notification. When configured for MPPS, the System sends information like which exam is in progress, when a Study is completed, how many images were acquired, and what was the radiation dose to which the patient was exposed during that session, etc.
Make this host the HIS/RIS source. (Only one host can be designated as the HIS/RIS source.)	Designates the host as the DICOM Worklist provider. Defining the Radiology Information System (RIS) and Hospital Information System (HIS) host allows you to download patient worklists from those networks to your system. **NOTE:** Only one HIS/RIS source may be designated on the system. Selecting this option will de-select any other hosts as the HIS/RIS source.

Remove Network Host

Follow this process to remove a network host.

1. From the Network Connections screen, select the network host.
2. Press [REMOVE].
   - A message appears: "Are you sure you want to remove (host name)?"
3. Press [YES].
   - [CANCEL] closes the message and returns you to the Network Connections screen without removing the connection.
   - The network host is removed.

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Perform C-Echo Test

Use this function when you want to check to see if the system is communicating with a particular network host.

For mobile units, the unit must be connected to the network for this test to be of any value.

1. Select a host from the Network Hosts list.
2. Press [C-ECHO TEST].
   - A message appears to notify you if the test passed or failed.
   - A "passed" message means that the network host is working and that you can retrieve exams from it or transfer exams to it.

Failed C-Echo Test

A "failed" message means that the system could not contact the network host.

Perform the following tasks to resolve the problem:

- Check that the unit is connected to the network.
- Try connecting the unit to a different network port. There may be a problem with the port itself.
- For units with wireless connection:
  - Check the signal strength
    - Remove any metal that is covering the antenna (e.g, lead apron, clip board)
    - Move the unit to another area with better reception
  - Try software reset to establish the wireless connection
- Re-try the test at a later time. The host may be temporarily unavailable.
- Confirm the host configuration on the Edit screen.
- If the problem persists, contact your technical support group or system administrator.

Printers

Follow this process to access the Network Connections screen.

1. On the Worklist screen, press [UTILITIES].
   - The System-System screen appears.
2. Press [NETWORK CONNECTIONS].
   - The Network Connections screen (Figure A7-5) appears.

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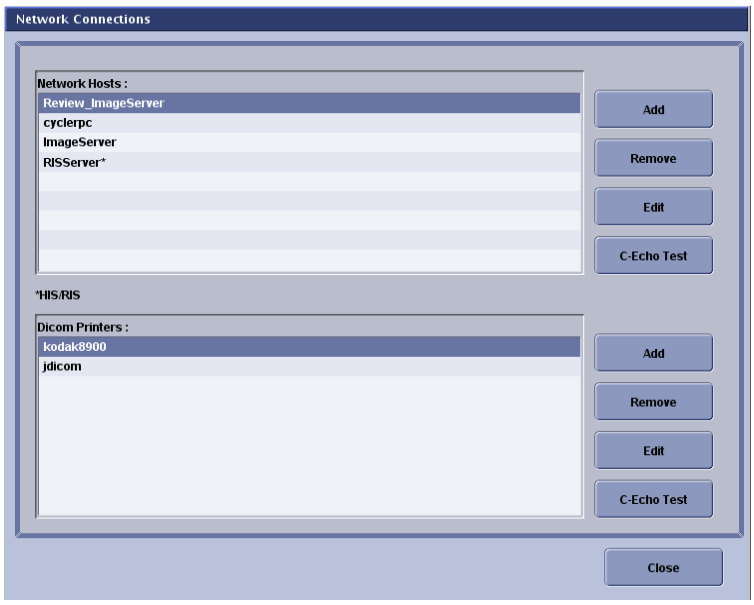
Figure A7-5 Network Connections screen



Add or Edit DICOM Printers

Adding and editing printers use very similar process and the same screens shown in Figure A7-6, Figure A7-7, and Figure A7-8. Table A7-3, Table A7-4, and Table A7-5 describe the fields in detail.

1. If Editing an existing printer's configuration, select the printer from the DICOM Printers list and press [EDIT].
   - If adding a new printer, press [ADD].
2. Complete requested information for all tabs (see Table A7-3, Table A7-4, and Table A7-5) and press [SAVE] to add the printer or save the changes.

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Figure A7-6 Add Printer screen – Printer Tab

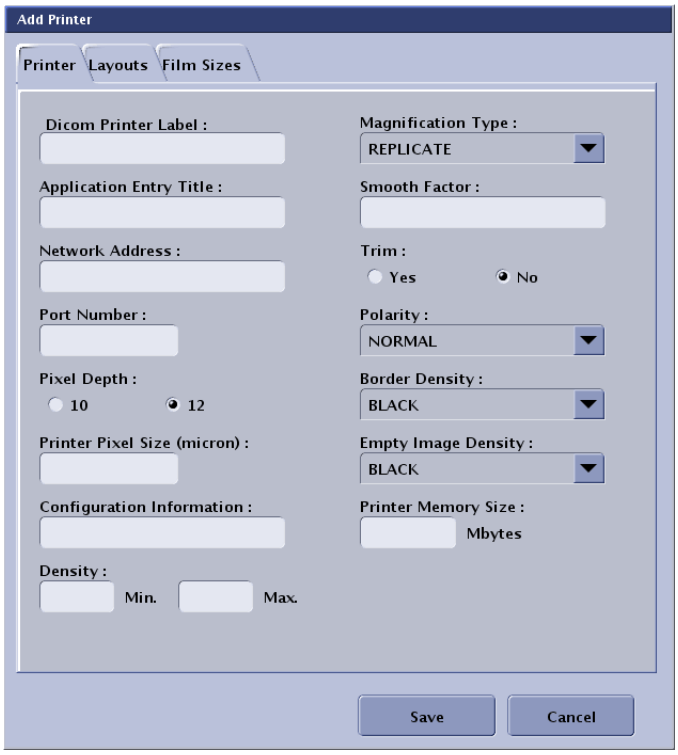

Table A7-3 Add Printer screen– Printer Tab description

Function	Description
DICOM Printer Label	The name of the printer that appears in the DICOM Printers list and on the print setup screens. **NOTE:** DICOM printer labels cannot have spaces in the name. Use underscores (_) to separate words.
Application Entry Title	The DICOM application title.
Network Address	The IP address of the printer.
Port Number	The port number of the printer.
Pixel Depth	The resolution of the printer.
Printer Pixel Size (micron)	Designates the pixel size the printer uses. This is specified by the printer manufacturer.
Configuration Information	A place for you to add notes about the printer or configuration.
Density	Sets the minimum and maximum density range.

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Function	Description
Magnification Type	Available options are: • Replicate • Bilinear • Cubic • None
Smooth Factor	Sets the image smoothing factor.
Trim	Designates if there is to be trim or not.
Polarity	Available options are: • Normal • Reverse
Border Density	Sets the color of the image border. Available options are: • Black • White
Empty Image Density	Sets the color of areas that have no image printed. Available options are: • Black • White
Printer Memory Size	Designates the memory size of the printer. This is specified by the printer manufacturer.

Figure A7-7 Add Printer screen – Layouts tab

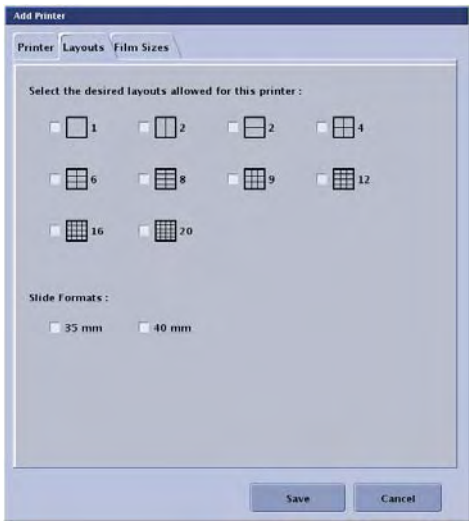

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Table A7-4 Add Printer screen– Layouts Tab description

Function	Description
Select the desired layouts allowed for this printer	Selections allow the number of images that may be printed on a single sheet of film or paper. Some selections control the orientation of the images on the page: for example, 2 images per page may be side by side or one on top of the other.
Slide formats	Selections allow the side formats available for the printer, if any.

Figure A7-8 Add Printer – Film Sizes tab

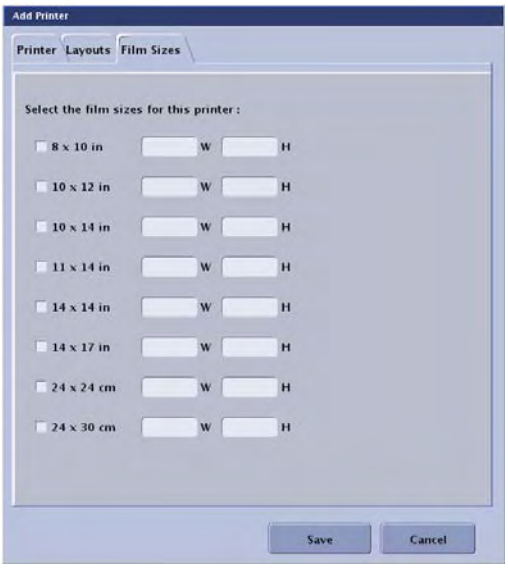

Table A7-5 Add Printer screen– Film sizes description

Function	Description
Film sizes (8 x 10in)	Selects the sizes of film available for the printer.
Pixel size: W (width)	Sets how wide the film is in pixels. This value is provided by the printer manufacturer based on what the printer supports.
Pixel size: H (height)	Sets how high the film is in pixels. This value is provided by the printer manufacturer based on what the printer supports.

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Remove DICOM Printer

Follow this process to remove a printer.

1. From the Network Connections screen, select the printer.
2. Press [REMOVE].
   - A message appears: “Are you sure you want to remove (printer name)?”
3. Press [YES].
   - [CANCEL] closes the message and returns you to the Network Connections screen without removing the connection.
   - The printer is removed.

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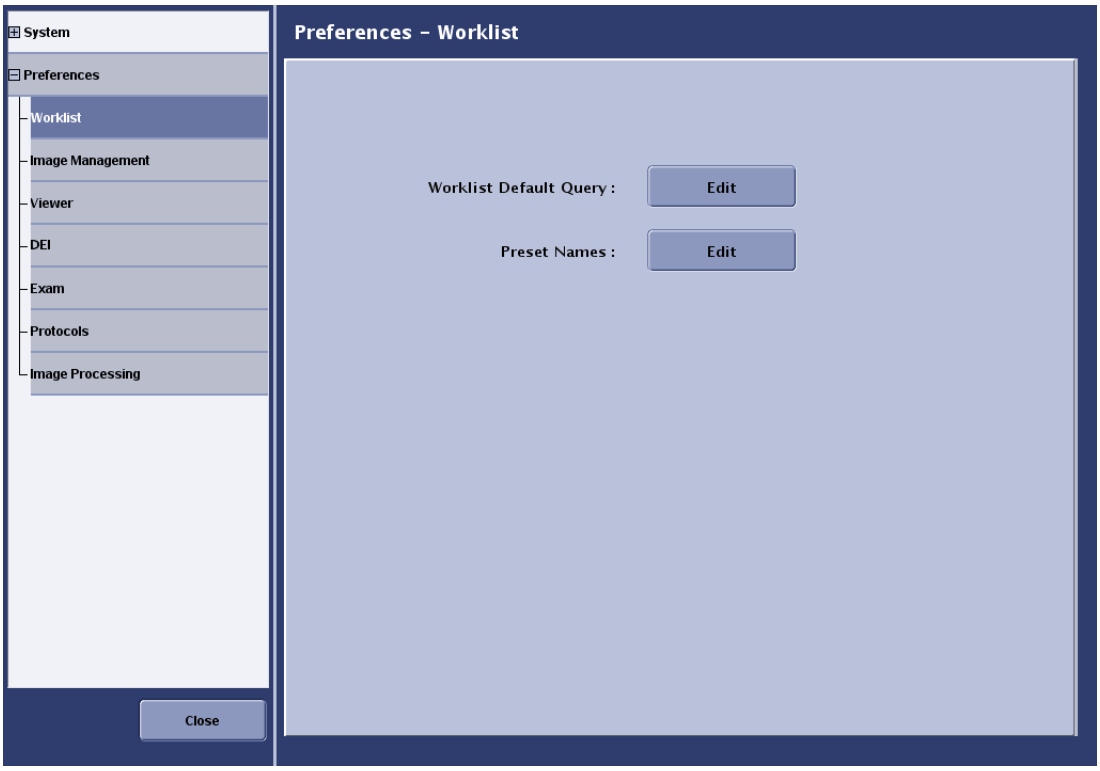
Worklist

Worklist preferences are available from the Utilities screen.

1. On the Worklist screen, press [UTILITIES].
2. Select **Preferences > Worklist**.

Figure A7-9 Preferences – Worklist screen



Default Query

The Worklist Default Query controls the amount of HIS/RIS information that appears on the Worklist and allows you to enable and configure the auto-refresh function.

1. Complete or edit the Worklist Default Query screen (Figure A7-10). Table A7-6 describes the fields in detail.
2. Press [SAVE] to change the Default Query.

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Figure A7-10 Worklist Default Query screen

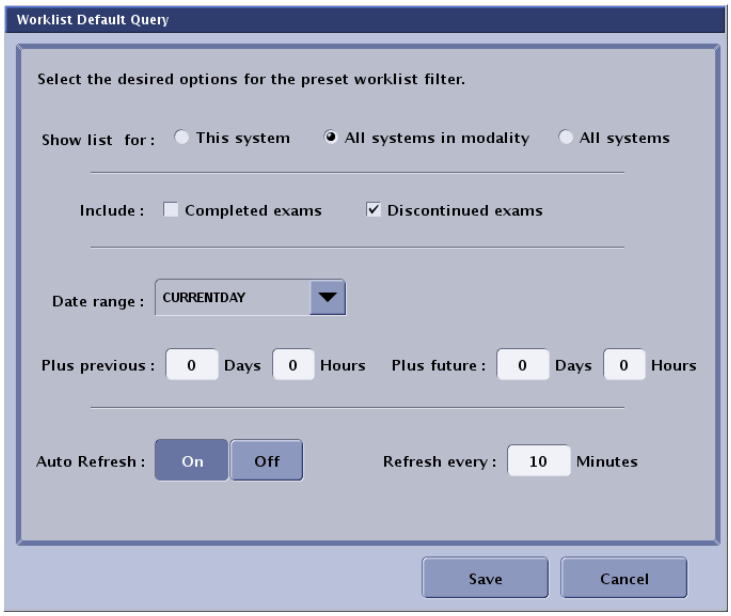

Table A7-6 Worklist Default Query description

Function	Description
Show list for	Determines Worklist items by system or modality. • This system – exams for this unit only • All systems in modality – exams for all digital x-ray • All systems – exams for all modalities
Include	Allows you to include or exclude completed or discontinued exams on the Worklist.
Date Range	Selects the date range of scheduled procedures to show on the Worklist. Available options are: • All • Current Day
Plus previous __ Days __ Hours	Shows procedures that are scheduled for the specified time before the selected date range. **NOTE:** If the "Days" value is left blank, the worklist query will be based on current time plus the number of hours entered.
Plus future __ Days __ Hours	Shows procedures that are scheduled for the specified time after the selected date range. **NOTE:** If the "Days" value is left blank, the worklist query will be based on current time minus the number of hours entered.

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Function	Description
Auto Refresh [ON] [OFF]	Turns Auto Refresh on or off.
Refresh every __ Minutes	If Auto Refresh is [ON], sets how often (in minutes) the Worklist refreshes. The interval may be between 1 and 9999 minutes.

Auto Refresh

The Worklist Auto-Refresh feature automatically refreshes the Patient Worklist at predefined time intervals.

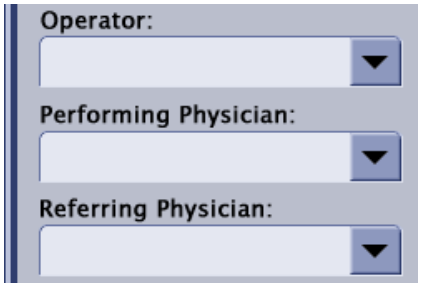
NOTE: You will not be able to make selections or access Worklist functions while the Worklist is refreshing.

NOTE: For large facilities, it is recommended that the auto refresh interval be set to a short time, for example, every 1 or 2 minutes. The system will refresh more often, but each refresh will take less time to complete.

Preset Names

The Preset Names screen (Figure A7-12) allows you to add, remove, or edit the names that appear on the Add Patient/Patient Information screen's Operators, Performing Physicians, and Referring Physicians drop-down lists (Figure A7-11).

Figure A7-11 Drop-down lists on the Add Patient screen



1. Follow the procedures below to Add, Edit, or Remove Preset Names.
2. When finished, press [SAVE] to retain the changes you made.

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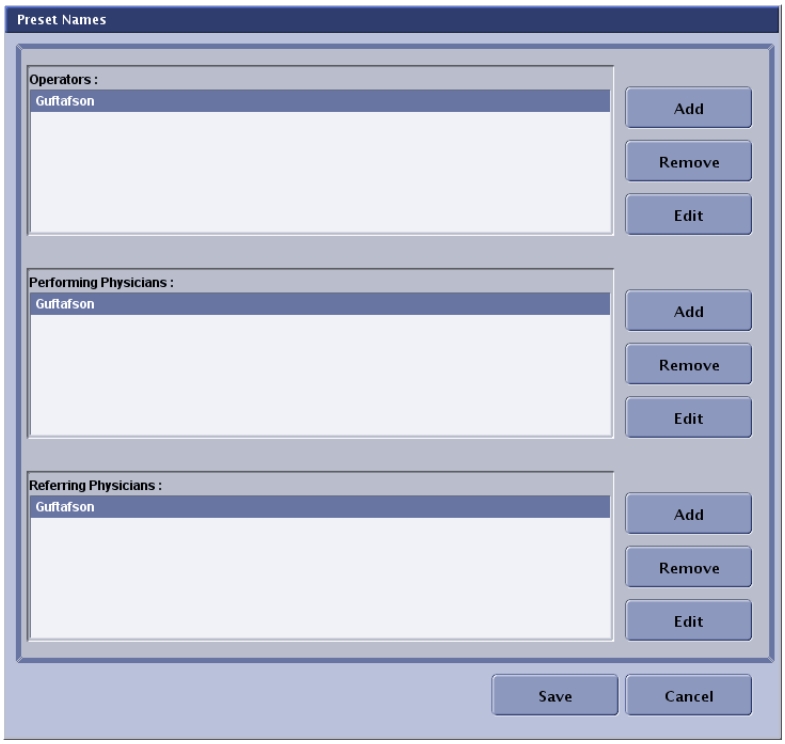
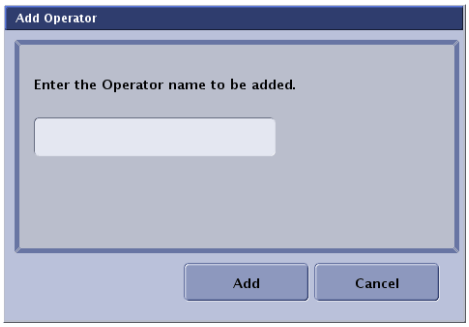
Figure A7-12 Preset Names screen



Add Preset Names

1. Press [ADD] for the appropriate group.
2. Type the name to add.
3. Press [ADD].



Edit Preset Names

1. Select the name to change.
2. Press [EDIT] for the group.
3. Edit the name as appropriate.
4. Press [SAVE].

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Remove Preset Names

1. Select the name to remove.
2. Press [REMOVE] for the group.
3. Press [OK] to remove the name.
   - Press [NO] to keep the name.

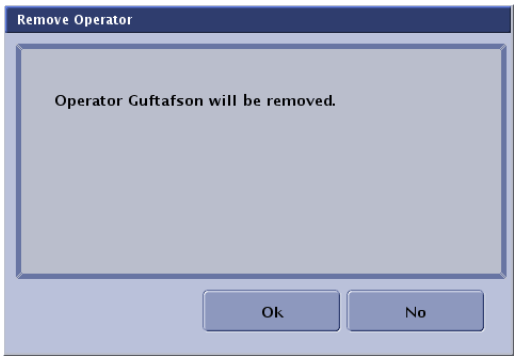

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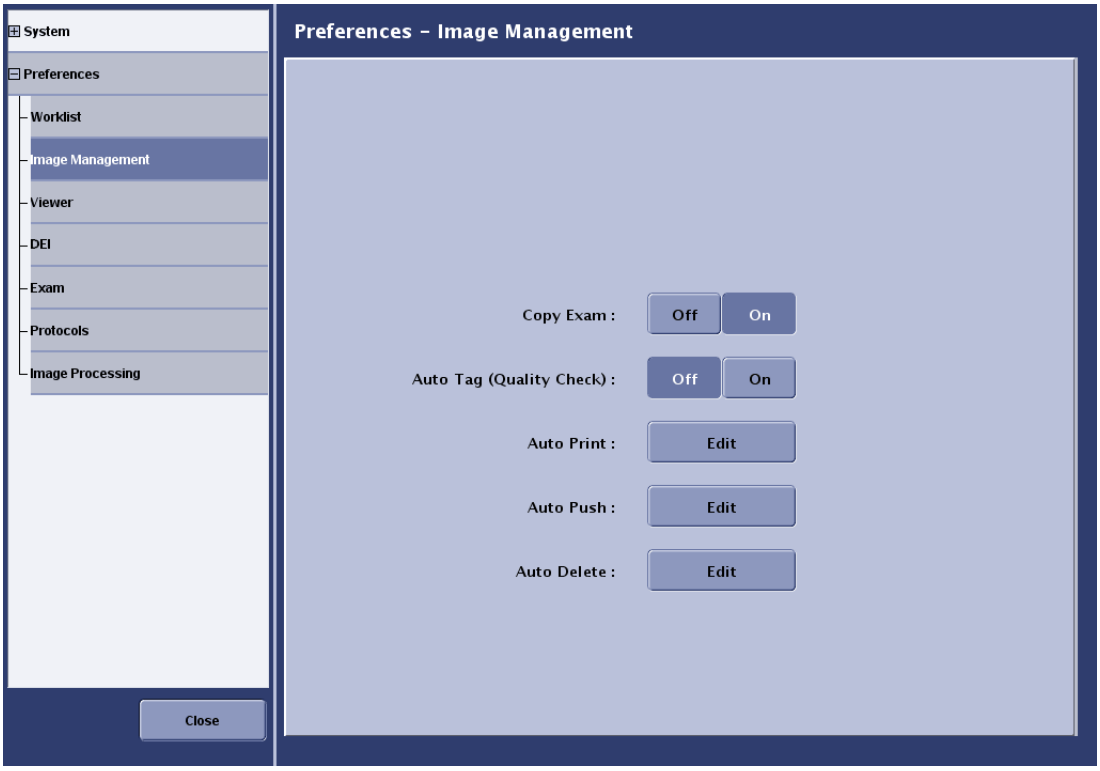
Image Management

Image Management preferences allow you to enable and configure the Copy Exam, Auto Tag, Auto Print, Auto Push, and Auto Delete functions.

Figure A7-13 Preferences – Image Management



Copy Exam

Enabling the Copy Exam function allows exams to be copied between the local databases and network hosts. It also allows exams to be copied to a CD.

There is no configuration for this function; it is either enabled (ON) or disabled (OFF).

Follow this process to enable or disable Copy Exam:

1. From the Worklist screen, press [UTILITIES].
2. Select **Preferences > Image Management**.
3. Press Copy Exam [ON] to enable the function.
   - Copy Exam [OFF] disables the function.
4. Press [CLOSE].

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Auto Tag (Quality Check)

Enabling Auto Tag (or Quality Check) provides an indicator on the Image Viewer screen to mark an image of acceptable quality. Auto Print and Auto Delete can be configured to act upon images that have the Quality Check mark.

There is no configuration for this function; it is either enabled (ON) or disabled (OFF).

Follow this process to enable or disable Auto Tag:

1. From the Worklist screen, press [UTILITIES].
2. Select **Preferences > Image Management**.
3. Press Auto Tag [ON] to enable the function.
   - Auto Tag [OFF] disables the function.
4. Press [CLOSE].

Auto Print

Default Print/Auto Print (Figure A7-14) allows you to configure your printer parameters. This is done so that you do not need to select all the parameters each time you print an image.

You can select a primary and alternative location as well as how many copies you want each time you print.

For mobile units, Auto Print will begin the next time the unit is connected to the network.

Follow this process to configure Auto Print.

1. From the Worklist screen, press [UTILITIES].
2. Select **Preferences > Image Management**.
3. Click Auto Print [EDIT].
   - The Default Print/Auto Print screen appears.
4. Complete the information as described in Table A7-7.
5. When finished, press [SAVE] to retain your changes.
6. Press [CLOSE].

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Figure A7-14 Auto Print

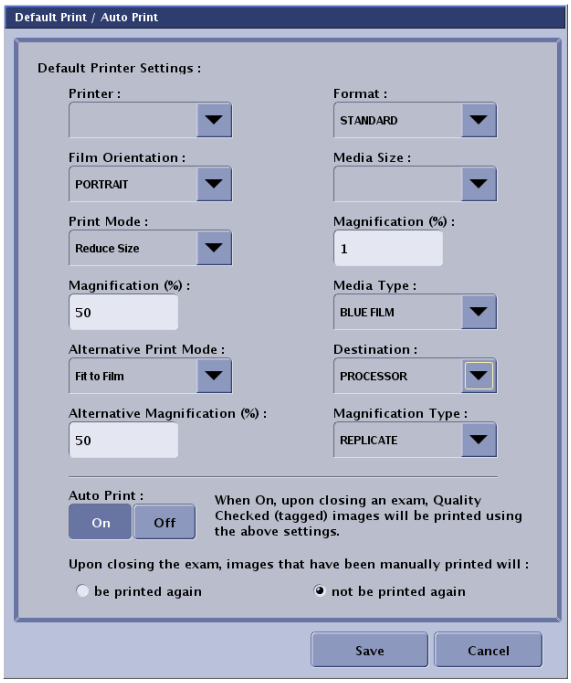

Table A7-7 Auto Print Functions

Function	Description
Printer	Lists the printers and laser cameras connected to your system.
Film Orientation	Sets if the image will print on the film horizontally or vertically. Available options are: • Portrait – vertical film orientation • Landscape – horizontal film orientation
Print Mode	Provides options on the size of the image data printed. Available options are: • True Size • Fit to Film • Reduce Size • Orthopedic Magnification (if enabled)
Magnification (%)	If Reduced Size is selected as the Print Mode, allows you to enter the percent by which the image will be reduced. The accepted range is between 40% and 90%. If True Size or Fit to Film are selected as the Print Mode, the text box remains disabled.

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Function	Description
Alternate Print mode	Available options are: • Reduce Size • Left/Right Justified • Fit to Film
Alternative Magnification (%)	Allows you to enter an image reduction factor for the secondary printer.
Format	Allows you to choose the formats available for the selected printer. Available options are: • Standard • Slide • Superslide
Media Size	Allows you to choose the size of the media available for the selected printer.
Media Type	Allows you to choose the media types available for the selected printer. Available options are: • Paper • Clear Film • Blue Film
Destination	Allows you to choose the destinations available for the selected printer. Available options are: • Magazine • Processor
Magnification Type	Allows you to choose the magnification types available for the selected printer. Available options are: • Replicate • Bilinear • Cubic • None
Auto Print [ON] [OFF]	If Auto Tag is enabled, turning Auto Print [ON] will automatically print all images that have the Auto Tag mark when the Image Viewer screen is closed. [OFF] disables the Auto Print function.
Upon closing the exam...	Allows the choice to automatically re-print or to not print any images that were printed manually from the Image Viewer screen.
[SAVE]	Saves the current selections and values as the default printing configuration.

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Function	Description
[CANCEL]	Closes the Auto Print screen without saving your changes.

Auto Send (Auto Push)

Auto Send automatically transfers images to another network device when the exam is closed. Auto Send is enabled and configured from the Utilities – Preferences screen.

For mobile units, Auto Send will begin the next time the unit is connected to the network.

Follow this process to configure Auto Send.

1. From the Worklist screen, press [UTILITIES].
2. Select **Preferences > Image Management**.
3. Click Auto Push [EDIT].
   - The Auto Send screen appears.
4. Complete the information as described in Table A7-8.
5. When finished, press [SAVE] to retain your changes.

Figure A7-15 Auto Send

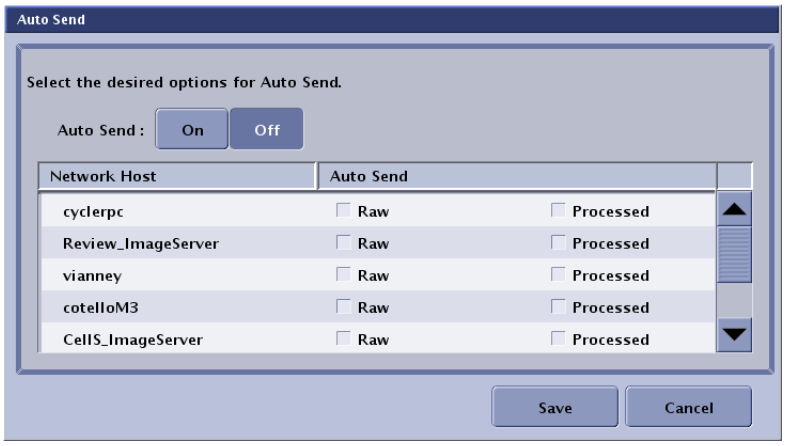

Table A7-8 Auto Send Functions

Function	Description
Auto Send [ON] [OFF]	Turns Auto Send on or off. Selecting On allows you to configure the default Auto Send settings.
Network Host column	Lists the available network locations where images may be transferred. Refer to Network Connections (p. A7-2) for information about how to configure the available Network Hosts.

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Function	Description
Auto Send column	Allows you to choose which images are sent to each network host. You may choose either Raw or Processed, both, or none. Leaving both choices unselected means that no images will be sent to the network host.
[SAVE]	Saves your selections as the default settings and closes the Auto Send screen.
[CANCEL]	Closes the screen without saving your changes.

Auto Delete

Auto Delete automatically deletes images when the image database does not have enough space. Auto Delete is enabled from the Utilities – Preferences screen.

Follow this process to configure Auto Delete.

1. From the Worklist screen, press [UTILITIES].
2. Select **Preferences > Image Management**.
3. Click Auto Delete [EDIT].
   - The Auto Delete screen appears.
4. Complete the information as described in Table A7-9.
5. When finished, press [SAVE] to retain your changes.
6. Press [CLOSE].

Figure A7-16 Auto Delete

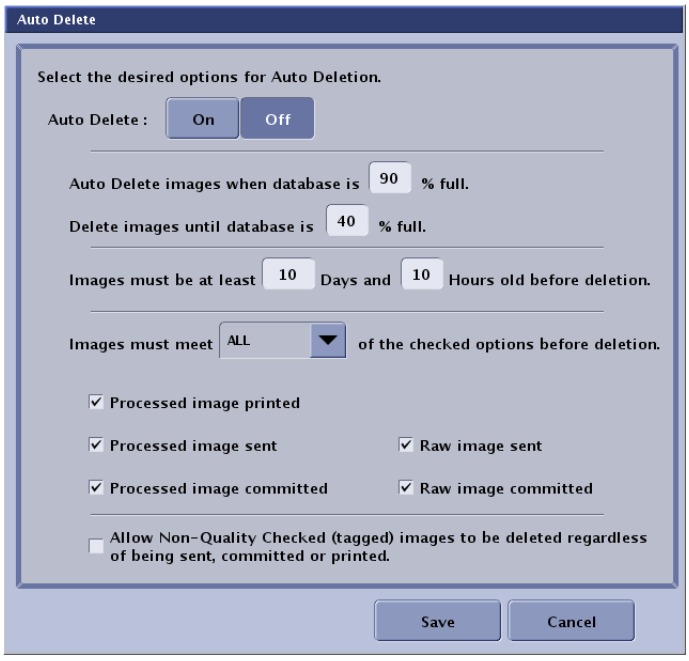

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Table A7-9 Auto Delete functions

Function	Description
Auto Delete [ON] [OFF]	Turns Auto Delete on or off.
Auto Delete images when database is __% full.	Specifies when to auto delete images based on database size.
Delete images until database is __% full.	Specifies how many images to delete based on database size.
Images must be at least __ Days old before deletion.	Specifies how old (in days) an image must be for it to be deleted. Images that are less than the entered number will not be deleted.
Images must meet __ of the checked options before deletion.	Allows you to constrain the deletion of raw and processed images based upon checkbox selection (see below). Available options are: • All • Any • None
Processed image printed	Selecting the Print parameter allows auto deletion of images that have been printed.
Processed image sent	Allows auto deletion of processed images with no errors that have been sent to another viewing station.
Processed image committed	Allows auto deletion of processed images that have been sent to a long term device with storage commitment capability. Storage commitment for a network host is configured from the System – System screen, Network Connections.
Allow Non-Quality Checked (tagged) images to be deleted regardless of being sent, committed or printed.	Allows auto deletion of any images that do not have the Auto Tag (Quality Check) mark. **NOTE:** If any of the images in the series have the Auto Tag (Quality Check) mark, the series will not auto delete.
[SAVE]	Saves your changes and closes the screen.
[CANCEL]	Closes the screen without saving changes.

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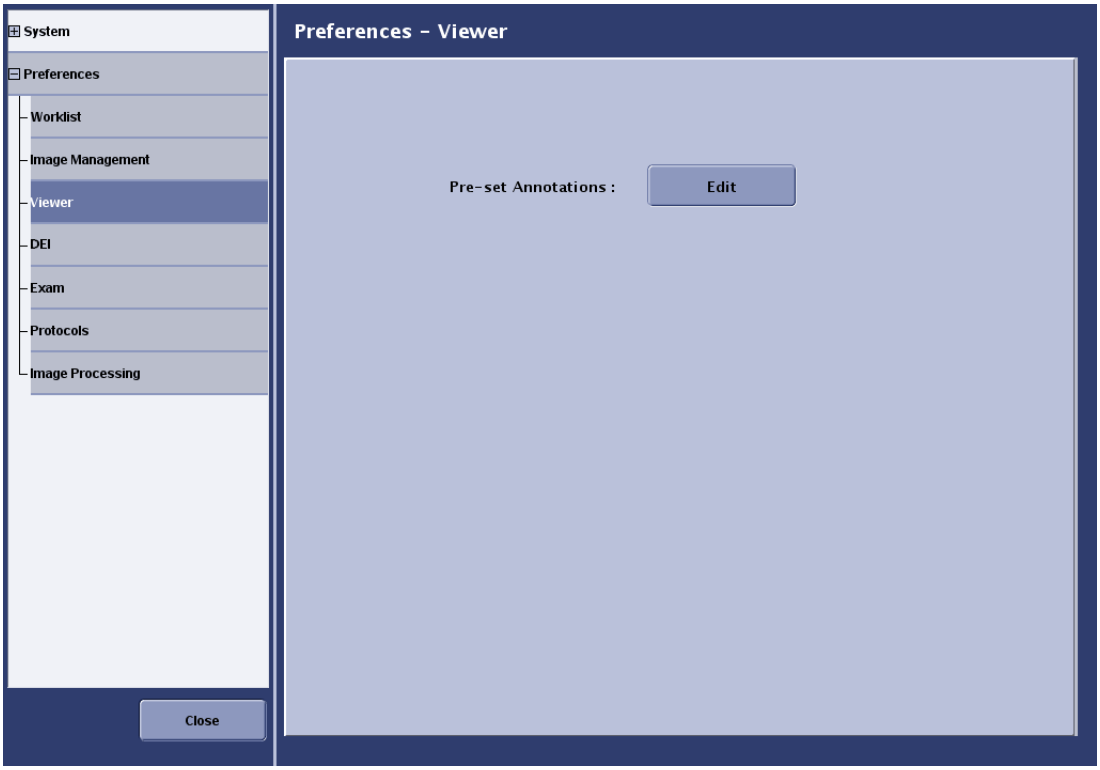
Image Viewer

Figure A7-17 Preferences - Viewer screen



Configure Pre-set Annotations

Viewer Preferences allow you to add, edit, or remove pre-set annotations.

Follow this process to configure pre-set annotations.

1. From the Worklist screen, press [UTILITIES].
2. Select **Preferences > Viewer**.
3. Press Pre-set Annotation [EDIT].
   - The Pre-set Annotations editing screen (Figure A7-18) appears.

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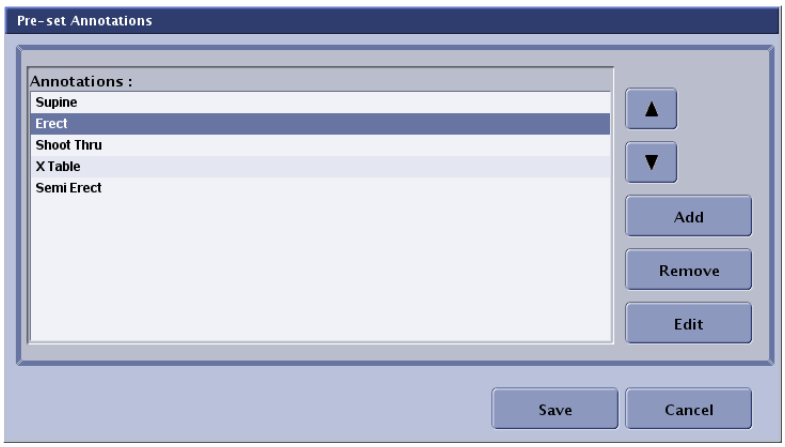
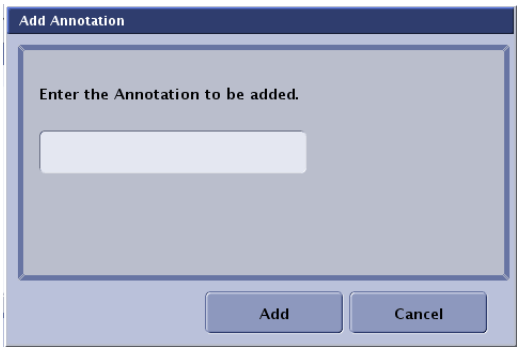
Figure A7-18 Pre-set Annotation editing



4. To change the order of the list, select the annotation.
5. Press the [▲] or [▼] button to move the item up or down the list.
6. Continue with Add Pre-set Annotation (p. A7-26), Edit Pre-set Annotation (p. A7-26), or Remove Pre-set Annotation (p. A7-27).
7. When finished, press [SAVE] to retain your changes.
8. Press [CLOSE].

Add Pre-set Annotation

1. From the Pre-set Annotations screen, press [ADD].
2. Enter the text of the annotation.
3. Press [ADD].



Edit Pre-set Annotation

1. From the Pre-set Annotations screen, select the annotation.
2. Press [EDIT].
3. Edit the text of the annotation.

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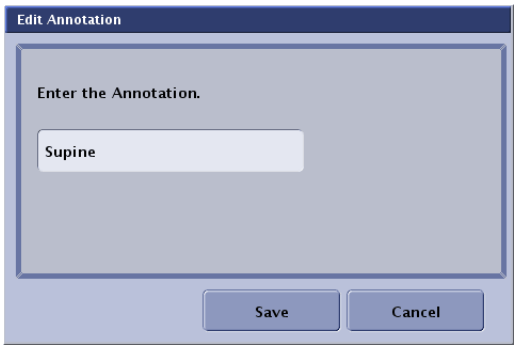
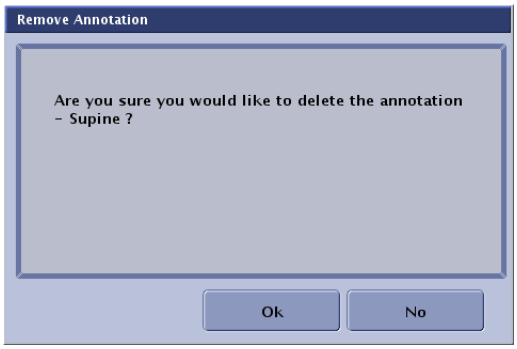
4. Press [SAVE].



Remove Pre-set Annotation

1. From the Pre-set Annotations screen, select the annotation.
2. Press [REMOVE].
   - A message appears: "Are you sure you would like to delete the annotation – (annotation name)?"
3. Press [OK].



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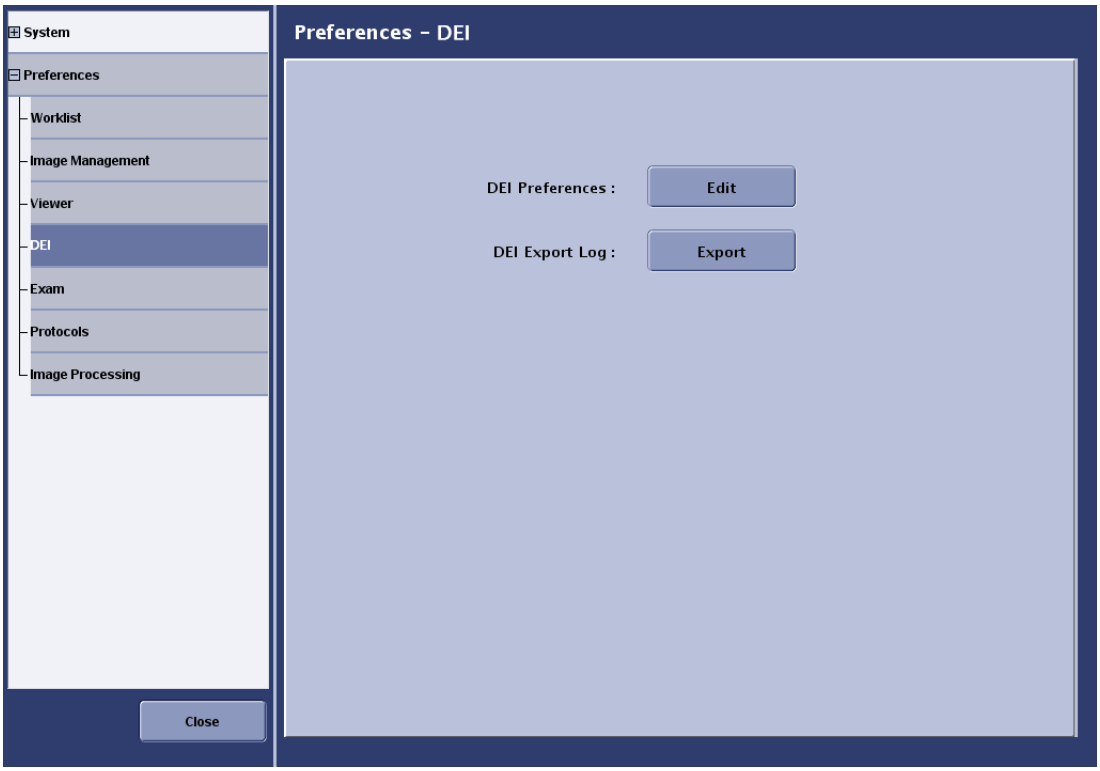
DEI (Detector Exposure Index)

Figure A7-19 Preferences - DEI screen



The Detector Exposure Index screen allows you to control if or how the DEI is displayed on the Image Viewer screen and to change the lower and upper limits for anatomical views.

These settings determine how DEI is displayed for all images.

Follow this process to change the DEI settings.

1. From the Worklist screen, press [UTILITIES].
2. Select **Preferences > DEI**.
3. Press **DEI Preferences** [EDIT].
   - The Detector Exposure Index screen (Figure A7-20) appears.
4. Continue with Change the DEI Display (p. A7-29) or Change the Lower and Upper Limits (p. A7-29).

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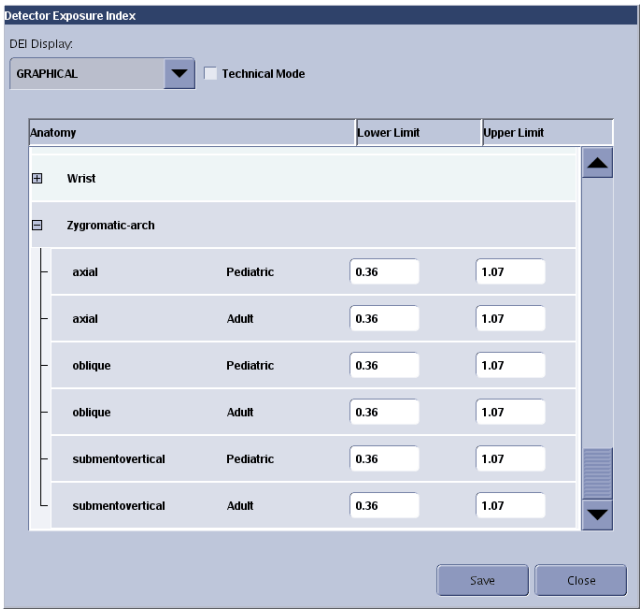
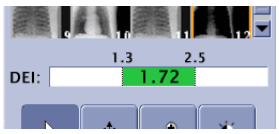
Figure A7-20 Detector Exposure Index screen



Change the DEI Display

1. On the Detector Exposure Index screen, press the **DEI Display** drop-down list to open it.
2. Select the display option.
   - Available options are:
     - No Display In this example, there is no DEI information displayed on the Image Viewer screen.
     - Numerical

In this example, only numerical DEI information is displayed on the Image Viewer screen.
     - Graphical 

In this example, DEI information is displayed is both numerically and graphically on the Image Viewer screen. This is the recommended display option.
3. Press [SAVE] to apply the change and close the screen.
   - [CLOSE] closes the screen without saving the changes.

Change the Lower and Upper Limits

1. On the Detector Exposure Index screen, press an anatomical category to expand it.
   - Press the category again to close it.
2. Change the lower and upper limits in the text boxes as appropriate for the view.

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3. Repeat steps 1 and 2 for all applicable anatomical categories.
4. Press [SAVE] when finished to apply the changes and close the screen.
   - [CLOSE] closes the screen without saving the changes.

Enable or Disable Technical Mode

Technical Mode is a special setting that configures the system for image quality testing and detector calibration. When Technical Mode is enabled, DEI is calculated using the central area of the image (512 pixels x 512 pixels) regardless of the imaged anatomy.

IMPORTANT!: Do not acquire exam images when Technical Mode is enabled. The use of Technical Mode is reserved for image testing and calibration purposes only.

The checkbox (Figure A7-21) indicates if Technical Mode is enabled. Check or uncheck the box as appropriate and press [SAVE] to apply the change and close the screen.

Figure A7-21 Technical Mode checkbox

Export DEI Log

The DEI log records the exposure levels of images. Medical Physicists in your facility or GE Service Personnel use the log to determine if there is a problem with the detector and to determine what adjustments to make to correct exposure errors.

Follow this process to export the DEI log onto a CD.

1. If necessary, connect the external CD drive to the unit.
2. Insert a blank CD-R disc.
3. From the Worklist screen, press [UTILITIES].
4. Select **Preferences > DEI**.
5. Press the **DEI Export Log** [EXPORT] button.
6. Remove the disc when export is complete.

Exam

There are currently no preferences to configure on this screen.

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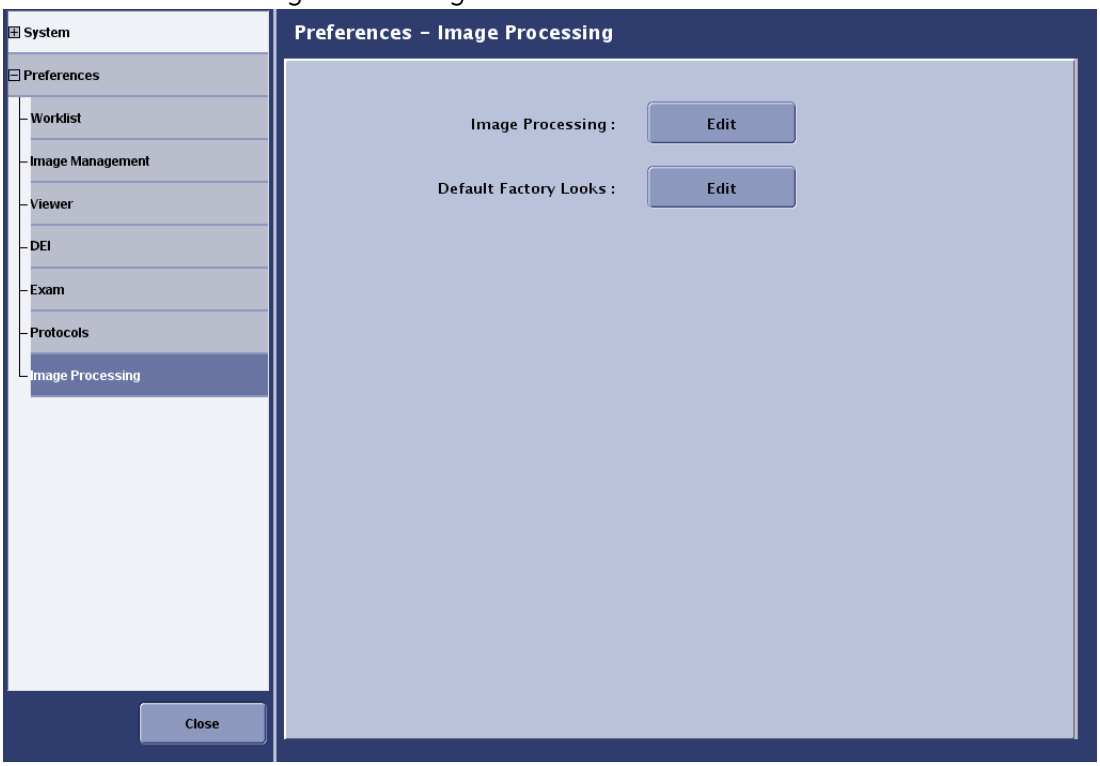
Image Processing

The Image Processing preferences allow you to change which look is the default for the anatomical view. Image Processing Preferences also allow you to view the settings of default factory looks or to create up to five (5) custom looks.

NOTE: Custom looks and the default looks mapping can be backed up by having GE Service personnel perform a system backup. It is recommended that a system backup be performed after any change to the default looks mapping or when custom looks are built. Ask your GE Service personnel to perform the system backup at their next visit. GE Service personnel can restore the settings from the backup, if necessary.

Figure A7-22 Preferences – Image Processing



Change Default Factory Looks for Exams

The Default Factory Looks screen (Figure A7-23) allows you to change the default processing setting for all 34 representative anatomical views, and then map this change to related anatomical views. Note that this may over-ride existing default settings.

At the initial applications setup, the radiologist chooses the default look for each anatomical view. Application specialists assign the looks to the system.

Follow this process to change the default factory looks.

1. From the Worklist screen, press [UTILITIES].
2. Select **Preferences > Image Processing**.

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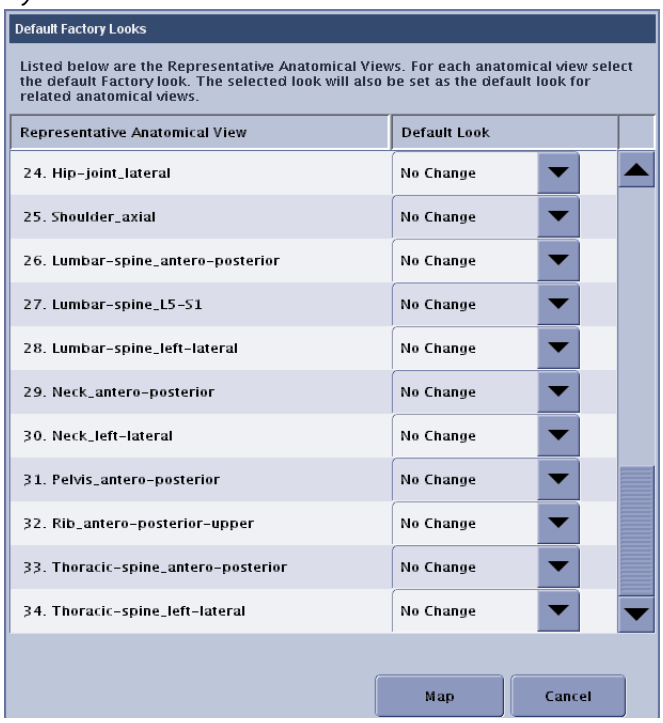
3. Press Default Factory Looks [EDIT].
4. Use the drop-down lists to change the default for the desired anatomical views.
5. When finished, click [MAP] to save the changes.
   - A message appears: "Default look settings for selected Representative Anatomical Views will be mapped to related anatomical views."
6. Click [CONFIRM] to apply the looks settings. [CONFIRM] will close the message and return you to the Image Processing screen.
   - [CANCEL] closes the message and returns you to the Default Factory Looks screen.

Figure A7-23 Default Factory Looks



Build Custom Looks

Looks are the way an image is processed to be viewed by a radiologist for interpretation.

Looks are pre-defined combinations of brightness, contrast, edge enhancement, and tissue equalization (TE). Refer to Tissue Equalization Overview (p. A7-36) for more information.

Factory Look descriptions:

- Factory Look 1 – similar to analog film, low edge, no TE
- Factory Look 2 – low CR look, low edge, moderate tissue contrast
- Factory Look 3 – moderate CR look, low edge, TE
- Factory Look 4 – highly digital look, high edge, high TE

Follow this process to create an new custom look.

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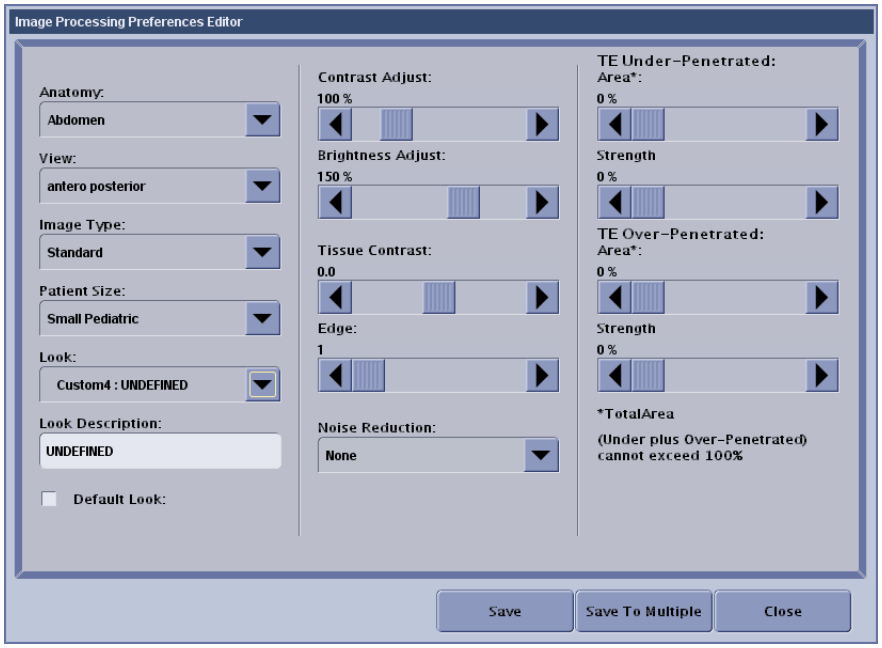
Recommendation: When building a custom look, start with the factory look that is closest to the desired result. Write down the values and apply them to a new custom process. Then change the applicable variables.

1. From the Worklist screen, press [UTILITIES].
2. Select **Preferences > Image Processing**.
3. Press Image Processing [EDIT].
   - The Image Processing Preference Editor (Figure A7-24) appears.

Figure A7-24 Image Processing Preference Editor



4. Select the **Anatomy** (for example: Chest, Abdomen, Lumbar Spine, etc.).
5. Select the **View** (for example: antero-posterior or lateral).
6. Select the **Image Type** (some systems may only have Standard image type available).
7. Select the **Patient Size**. Available options are: Small Adult, Medium Adult, Large Adult, Small Pediatric, Medium Pediatric, or Large Pediatric.
8. Select the **Look**. Choose the first "Undefined" Custom look.

NOTE: If a Factory Look is selected, parameters are read-only. Only Custom processing looks can be changed.

9. Enter new name in **Look Description** to rename the look:
   - The system will not accept a new look if the name remains "Undefined."
10. Check the **Make Default** box to set this look at the default for the selected Anatomy.
11. Adjust parameters as described in Table A7-10. Parameters may be adjusted in any order.

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Table A7-10 Image Processing parameters

Parameter	Definition
Contrast Adjust	Adjusts image contrast. Also known as window width. • Move the slider right for more contrast (towards pure black and white). • Move the slider left for less contrast (towards uniform gray). Range: 25% – 400% with increment of 1%
Brightness Adjust	Adjusts image brightness from 25-210%. Also known as window level. • Move the slider right for a lighter image. • Move the slider left for a darker image. **NOTE:** Brightness Adjust and Contrast Adjust should not be used for per-image tuning/correction of brightness and contrast. They are used to modify the default look of images from a particular exam. For example, if images from a particular type of exam are appearing consistently lighter than they should be, the Brightness Adjust slider can be moved left to adjust. However, for small alterations of brightness on a particular image, use the Brightness and Contrast controls in the Image Viewer screen.
Tissue Contrast	Controls the general contrast between the thick and thin anatomy. • Move the slider right to decrease bone/soft-tissue contrast. • Move the slider left to increase bone/soft-tissue contrast. Range: –0.15 to 0.15 with 0.01 increments. **NOTE:** Unlike Tissue Equalization, which controls contrast within under-penetrated (thick) or over-penetrated (thin) areas, Tissue Contrast controls the general contrast **between** the thick and thin anatomy. For example, Tissue Contrast can be used in combination with Tissue Equalization to define a Chest PA look that is equalized in the lung fields, but with light spine/ribs.
Edge	The amount of detail visible in bone structures. Increased edge equals increased detail. • Move the slider right to make images sharper. • Move the slider left to make images smoother. Range: 1 to 10 (discrete setting) with increments of 1

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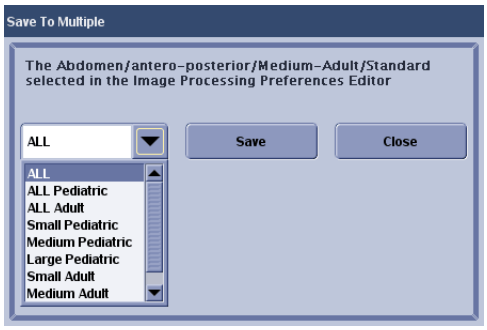
Parameter	Definition
Noise Reduction	Suppresses the mottle noise in denser areas of the anatomy while preserving detail in the rest of the image. Available options are: • None – no noise reduction • Low • Medium • High – maximum noise reduction **NOTE:** The noise reduction feature suppresses the mottle noise in denser areas of the anatomy while preserving detail in the rest of the image. The algorithm takes into account tissue penetration and dose reaching the detector. For example, if two Chest PA images were acquired on the same patient, one with much higher dose than the other, noise reduction may only affect the lower dose (higher noise) image. In general, the lowest Noise Reduction setting that produces the desired image quality should be selected.
TE Settings	See Tissue Equalization section for range and effect of TE sliders. **NOTE:** The combined total of the TE Under-penetrated and TE Over-penetrated areas cannot exceed 100%. The slider will automatically stop and a message appears: "The Total Area cannot exceed 100%. Reduce the (Under- or Over-) Penetrated area to proceed."

12. When finished adjusting parameters, press [SAVE] or [SAVE TO MULTIPLE].
    - [SAVE] applies the parameters to the currently selected patient size.
      - A message appears: "Save changes?"
13. Press [YES].
    - [SAVE TO MULTIPLE] applies the parameters to multiple patient sizes within the selected anatomy.
      - The Save to Multiple screen appears.
14. Select the **Patient Size** to save the new look to.
15. Press [SAVE].



16. Press [CLOSE] on the Image Processing Preference Editor.

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Change Image Processing from the Viewer

Changing the image processing from the Image Viewer screen allows the user to preview the effect of different looks (factory or custom) before applying the look to the image.

The Image Processing settings may be accessed from the Image Viewer screen or the Utilities screen.

From the Image Viewer screen:

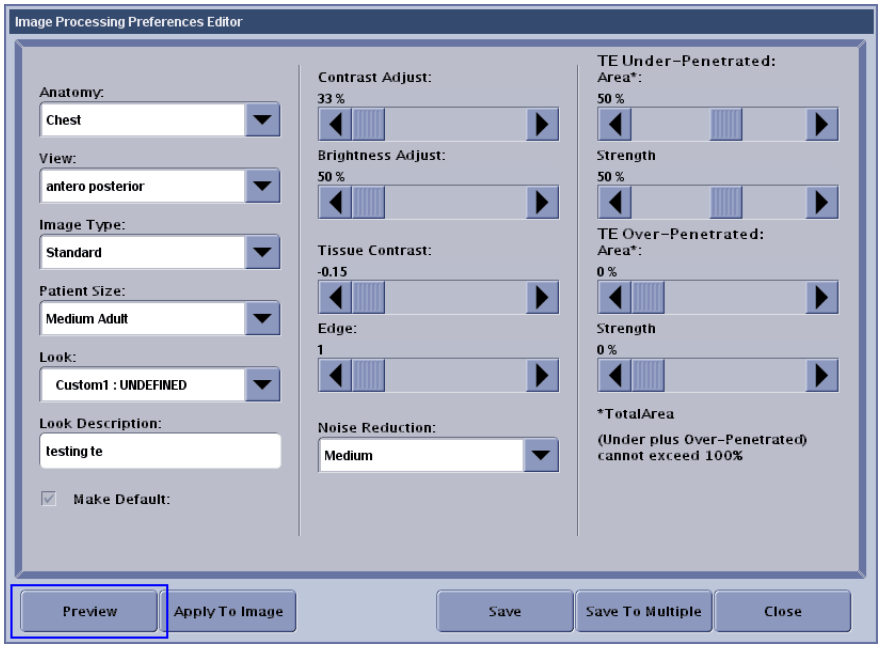
1. Select the **Reprocessing** palette from the tool selection list.
2. Press [EDIT PROC].

Follow the steps listed above to make the processing changes.

When opened from the Image Viewer screen the, Image Processing Preference Editor screen also has a [PREVIEW] and [APPLY TO IMAGE] button.

- [PREVIEW] applies the settings to the currently selected image in the Image Viewer screen so that you can see the effect before saving the changes.
- [APPLY TO IMAGE] creates a new instance of the image processed with the selected look.

Figure A7-25 Image processing preferences editor screen opened from the Viewer



Tissue Equalization Overview

Tissue Equalization (TE) is an advanced image-processing algorithm that improves contrast and visibility in over-penetrated and under-penetrated regions of an image without compromising the contrast in other regions of interest. In combination with the wide dynamic range of the digital detector, TE allows display of more information collected in a single shot, reducing re-takes and increasing throughput.

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TE Usage

Over-penetrated Regions

An over-penetrated region in an image results from x-rays passing through a relatively less dense region of the anatomy such as soft tissue (skin edge).

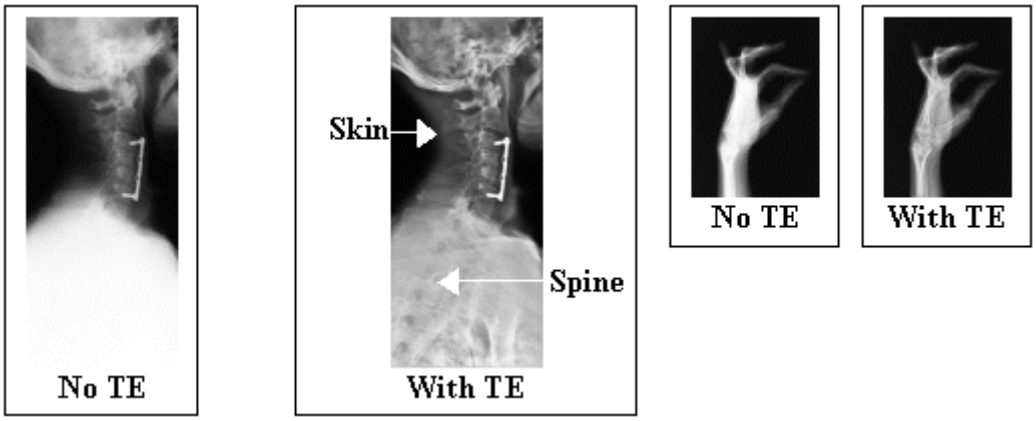
Over-penetrated regions of an image appear darker with reduced contrast. Using TE, the contrast in such regions can be enhanced to improve visualization of soft-tissue. TE can also be used to enhance vessel contrast in lungs. In Figure A7-26, the skin edge around the neck is more clearly defined with TE.

Under-penetrated Regions

An under-penetrated region in an image results from insufficient x-rays passing through relatively dense anatomical regions. For example, anatomy containing dense tissue (abdomen) and bone (ankles/wrists/ shoulders) result in under-penetrated images.

Under-penetrated regions of an image such as the cervical and thoracic spine appear white- white spine obscured by the overlaying anatomy like the white shoulders. Using TE, the overlaying anatomy can be made grayer making the underlying spine more visible (Figure A7-26). A hand image can similarly be displayed with improved bone contrast. This makes TE an invaluable tool in visualizing the entire bone field.

Figure A7-26 Comparison with and without Tissue Equalization



TE Parameters

TE uses the information in the image to improve visualization. Two user-defined parameters; AREA and STRENGTH; control the extent and amount of TE that is applied to the image. There is an AREA and STRENGTH parameter for over-penetrated regions and an AREA and STRENGTH parameter for under-penetrated regions.

Area

The AREA parameter defines the extent of application of the TE algorithm to the image. Increasing AREA increases the number of image pixels to which TE is applied. For example, in Figure A7-27, setting the AREA to 30% for under-penetrated region uses the pixels within the dotted ROI. Increasing AREA to 60% increases the number of pixels where TE is applied, as indicated by the solid ROI.

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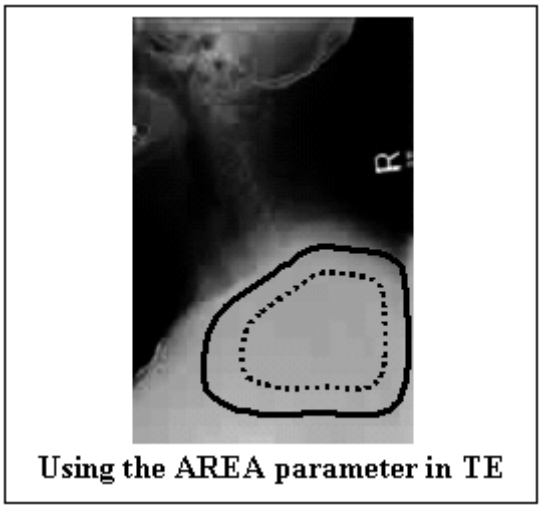
Figure A7-27 Using the AREA parameter in TE



The combined AREA parameters for the over and under-penetrated regions cannot be greater than 100%. For example if the AREA parameter for over-penetrated regions is set to 40%, the AREA parameter for under-penetrated regions cannot be greater than 60% (100-40).

Strength

The STRENGTH parameter affects the grayness of a region when TE is applied to it. For example, increasing STRENGTH for under-penetrated regions such as shoulders makes a white region grayer. Increasing STRENGTH for over-penetrated regions such as lungs makes a black region grayer. In both cases, increasing STRENGTH generally makes the region grayer.

The effect of varying AREA and STRENGTH in TE is demonstrated in Figure A7-28 for under-penetrated regions. Increasing STRENGTH while keeping the AREA constant makes the pixel grayer in the shoulder region. Increasing AREA extends the region that becomes gray.

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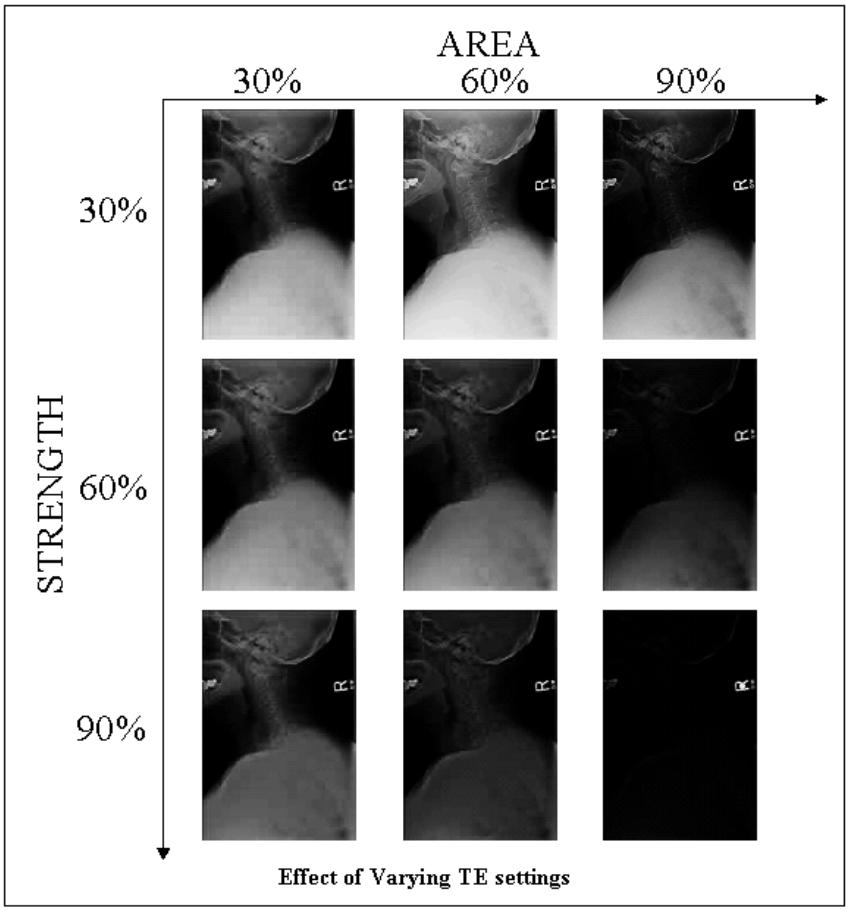
Figure A7-28 Varied TE settings



NOTE: Unlike Tissue Equalization, which controls contrast within under-penetrated (thick) or over-penetrated (thin) areas, Tissue Contrast controls the general contrast between the thick and thin anatomy. For example, Tissue Contrast can be used in combination with Tissue Equalization to define a Chest PA look that is equalized in the lung fields, but with light spine/ribs.

Protocols

Protocols preferences allow you to create backup copies of the protocol database, retrieve saved backups, and create new protocols.

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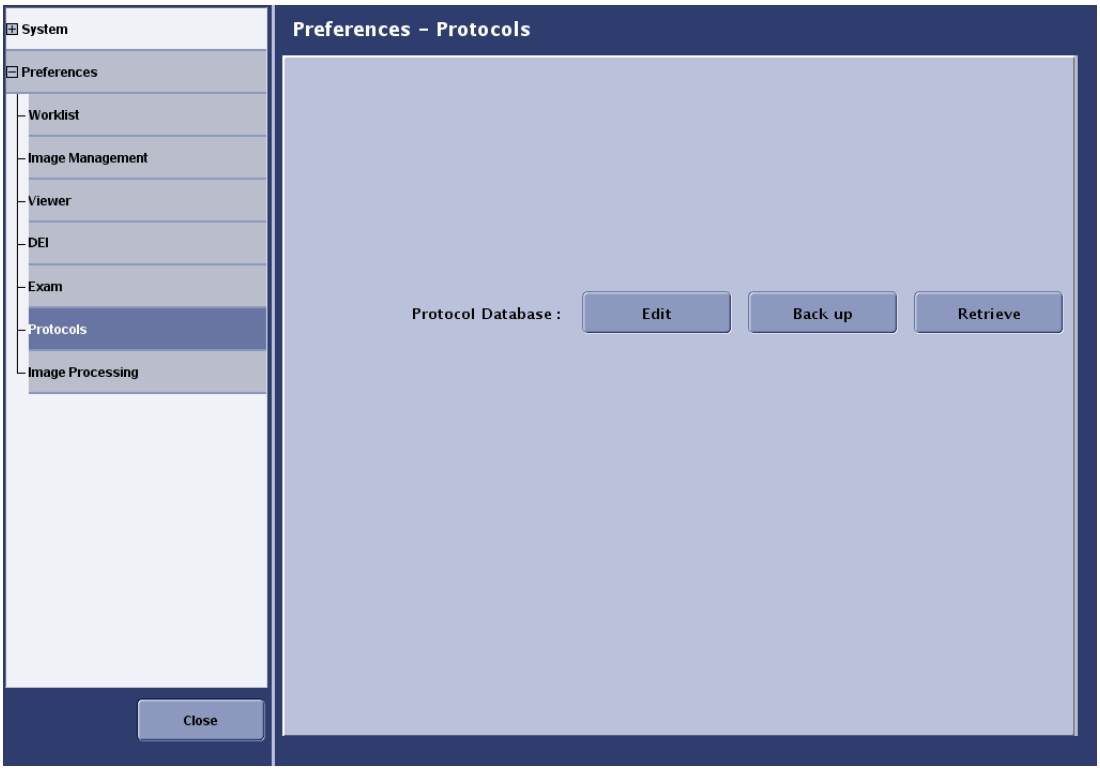
Figure A7-29 Preferences - Protocols screen



Backup Protocol Database to CD

The Backup function allows you to save the entire protocols database (parameters) to a CD. This is important when editing protocols; backup ensures that the current database stays intact. Backup is also important in case of system failure and all protocol information is lost. If necessary, the old database can be retrieved and used.

Follow this process to back up the database to a CD.

NOTE: Always use a new, blank CD-R for each back up.

DO NOT use re-writable (CD-RW) disks. The system cannot write to this type of disk.

1. If necessary, connect the external CD drive to the unit.
2. Insert a blank CD into the CD tray.
3. From the Worklist screen, press [UTILITIES].
   - The Utilities screen appears.
4. Select **Preferences > Protocols**.
5. Press [BACK UP].
   - A message appears: “Press OK to continue with Protocol Database back up.”

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6. Press [OK].
   - A message appears: “Protocol Database back up in progress. Please Wait. This might take 2-3 minutes.“
     - [CANCEL] stops the database backup.
   - When backup is complete, a message appears: “The Protocol Database back up operation is successful.“
7. Press [OK] to dismiss the message.
8. Remove the CD from the CD tray.
9. Label the CD and store it in a safe place.

Retrieve Protocol Database from CD

The Retrieve function allows you to recover a protocol database that was saved to a CD.

NOTE: When retrieving, the procedures saved on the CD will overwrite all of the procedures on the system.

Follow this process to retrieve a protocol database from CD.

1. If necessary, connect the external CD drive.
2. From the Worklist screen, press [UTILITIES].
   - The Utilities screen appears.
3. Select **Preferences > Protocols**.
4. Insert the CD with the saved protocols database into the CD tray.
5. Press [RETRIEVE].
   - A message appears: “Press OK to continue with Protocol Database retrieve.”
6. Press [OK].
   - The saved protocol database is loaded onto the system.
7. Remove the CD from the CD tray. Store the CD in a safe place.

Edit Protocol Database

The Protocol Editor allows you to create custom acquisition protocols. It allows the creation of anatomical categories, exam sets, and individual views for exams.

It allows the edit and removal of categories, exams, and views.

NOTE: Names of categories, exams, and views cannot contain spaces. Use underscores (_) to separate words (for example, “Neck_AP”).

NOTE: It is recommended that you back up the database to CD before and after custom changes are made. Database backup is done by pressing the [BACKUP] button on the Preferences - Protocols screen. Refer to Backup Protocol Database to CD (p. A7-40) for more information.

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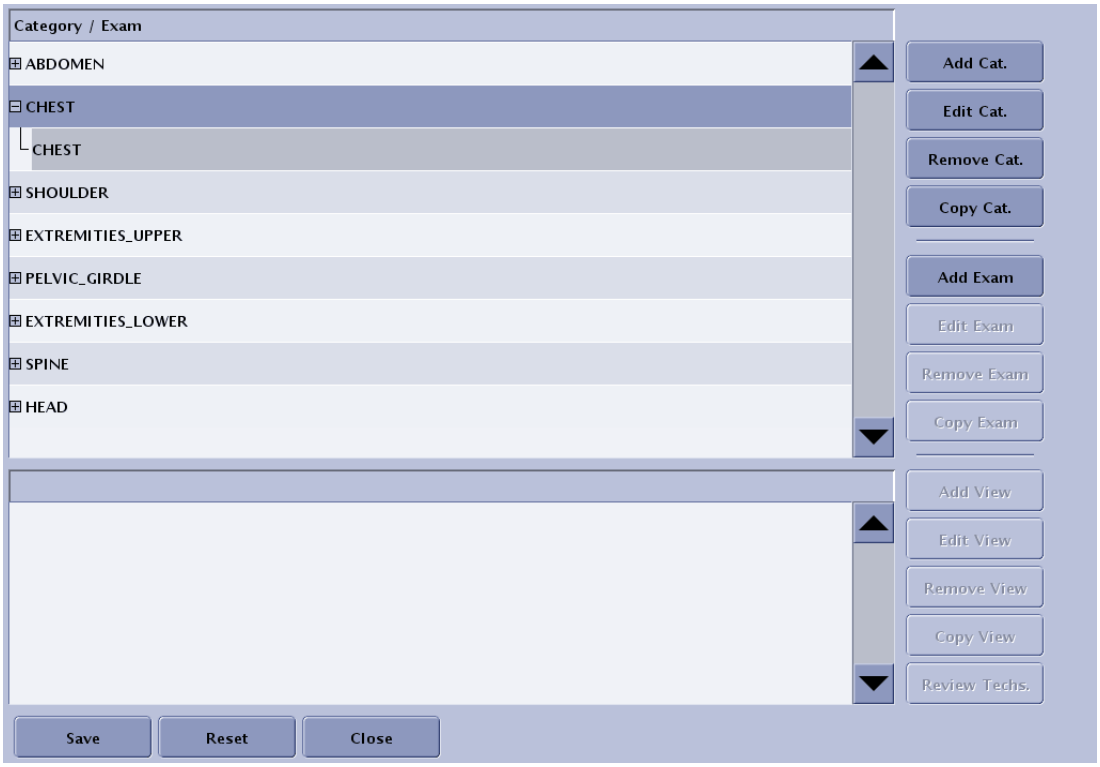
Follow this process to access the Protocol Database Editor.

1. From the Worklist, select [UTILITIES].
2. Select **Preferences > Protocols**.
3. Press [EDIT].
   - The Exam Menu appears.
4. Continue with Add or Edit Category (p. A7-42), Add or Edit Exam (p. A7-43) or Add or Edit View (p. A7-44)

Figure A7-30 Exam Menu



Add or Edit Category

NOTE: The screens and process to edit a category are the same as for adding a category.

From the Exam Menu:

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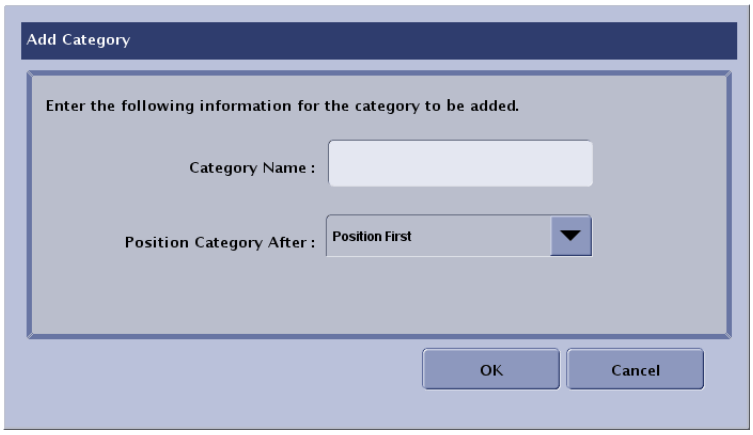
1. Press [ADD CAT] or [EDIT CAT].
   - If editing a category, select the category first, then click [EDIT CAT].
   - The Add Category (or Edit Category) screen appears.



2. Type a **Category Name**. (Use underscores instead of spaces.)
3. From the **Position Category After** drop-down list, select the placement of the new category on the category list.
4. Press [OK].
5. Continue with Add or Edit Exam (p. A7-43).

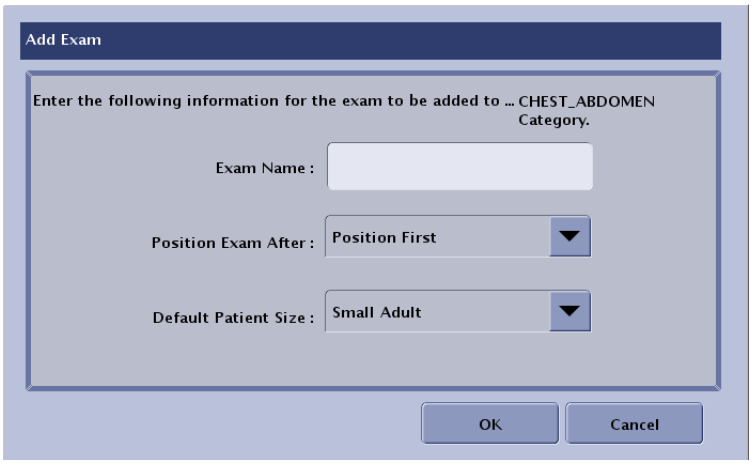
NOTE: Exams and views must be added or copied into the new category in order for it to be fully functional.

Add or Edit Exam

NOTE: The screens and process to edit an exam are the same as for adding a exam.

From the Exam Menu:

1. Select the category for the new exam.
2. Press [ADD EXAM] or [EDIT EXAM].
   - The Add Exam (or Edit Exam) screen appears



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3. Type an **Exam Name**. (Use underscores instead of spaces.)
4. From the **Position Exam After** drop-down list, select the position of the exam within the category.
5. Select the **Default Patient Size** for the exam.
6. Press [OK].
7. Continue with Add or Edit View (p. A7-44).

NOTE: Exams must be populated with new or copied views after creation in order to be fully functional

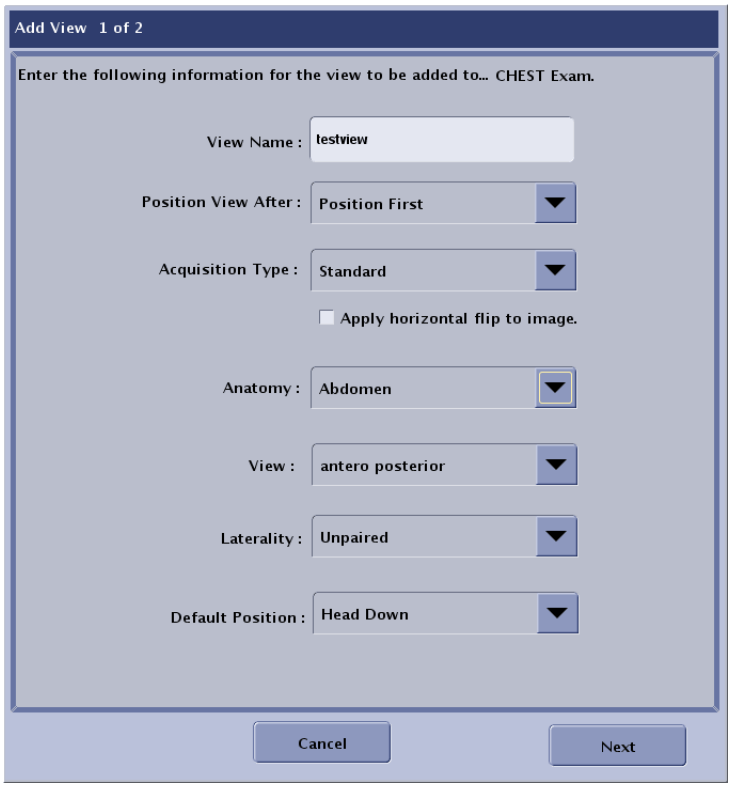
Add or Edit View

NOTE: The screens and process to edit a view are the same as for adding a view.

This process has multiple screens.

From the Exam Menu:

1. Expand the Category.
2. Select the Exam to add or copy the new view to.
3. Press [ADD VIEW] or [EDIT VIEW].
   - The Add View (or Edit View) screen (1 of 2) appears.



4. Type a **View Name**. Do not use spaces. Use underscores (_) to separate words.

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5. From the **Position View After** drop-down list, select the placement of the view within the exam.
6. Select the **Acquisition Type**.
   - Available options are:
     - Standard
     - Bone
     - Soft Tissue
7. Check if **horizontal flip** is to be applied when displaying the image.
8. Select the **Anatomy**.

NOTE: The selected anatomy will determine the image processing for the view. Be sure to select the appropriate anatomy for the body part imaged.

9. Select the most appropriate **View** (AP, Lat, etc.).
   - The selected anatomy determines which views are available.
10. Select the **Laterality**:
    - The selected anatomy determines which laterality options are available.
      - If the anatomy is unpaired, then Unpaired is the only available selection.
      - If the anatomy is paired, the available sections are: Both, Left, and Right.
      - Paired anatomy enables the Patient Side control on the Image Acquisition screen. Refer to Chapter A4: Image Acquisition for more information.
11. Select the Default Position:
    - The selected anatomy determines which positions are available. In general:
      - If the anatomy is unpaired, the selections are Head Down or Head Up
      - If the anatomy is paired, the selections are Digits to Back, Digits to Feet, Digits to Front, Digits to Head.

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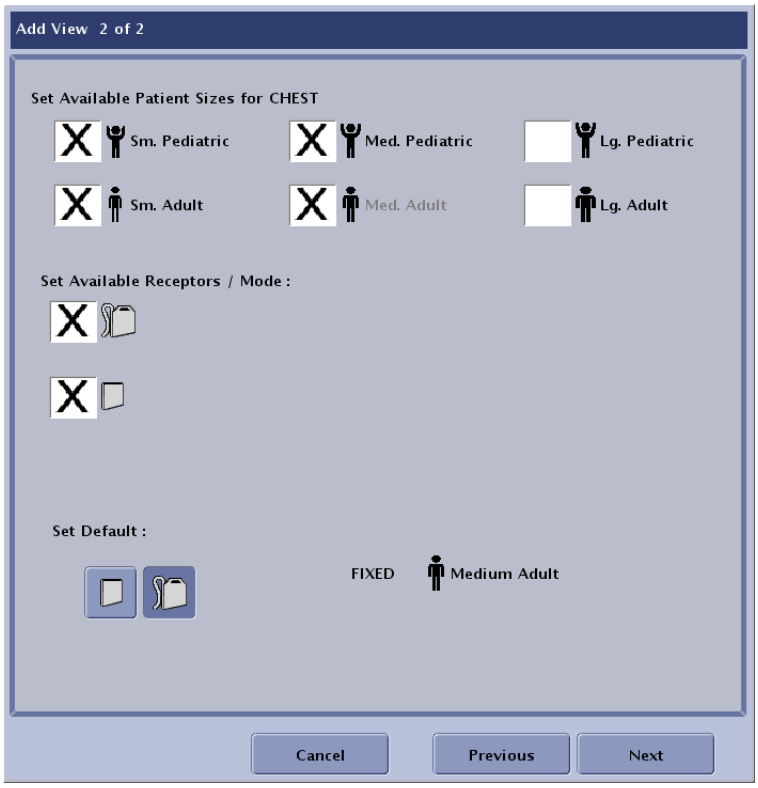
12. Press [NEXT].
    - The Add View (or Edit View) screen (2 of 2) appears.



13. Select all **Patient Sizes** you want available for the view. The default size will automatically be selected.
14. Select **Receptors** and **Modes** for each selected receptor.
15. Select the **Default Receptor** - cassette or GE Portable DR Detector.

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16. Press [NEXT].
    - The Review screen appears.

CHEST / CHEST /
testview
Standard Acquisition
kV
mA
mAs (Fixed only)
msec (b = back-up time)
Speed
SID
Ion Chamber (AEC Only)
Focal Spot
Cu Filter
Grid
Small Adult FIXED 50 100 2.5 25.0 400 100 N/A Small no out
Med Adult FIXED 50 100 2.5 25.0 400 100 N/A Small no out
Small Ped FIXED 50 100 2.5 25.0 400 100 N/A Small no out
Med Ped FIXED 50 100 2.5 25.0 400 100 N/A Small no out
Small Adult FIXED 50 100 2.5 25.0 400 100 N/A Small no out
* Med Adult FIXED 50 100 2.5 25.0 400 100 N/A Small no out
Small Ped FIXED 50 100 2.5 25.0 400 100 N/A Small no out
Med Ped FIXED 50 100 2.5 25.0 400 100 N/A Small no out
Exam Menu
Edit Technique

    - The default patient size is shown with an asterisk (*) to the left of the size indicator.

17. Select the patient size to edit.
18. Press [EDIT TECHNIQUE].

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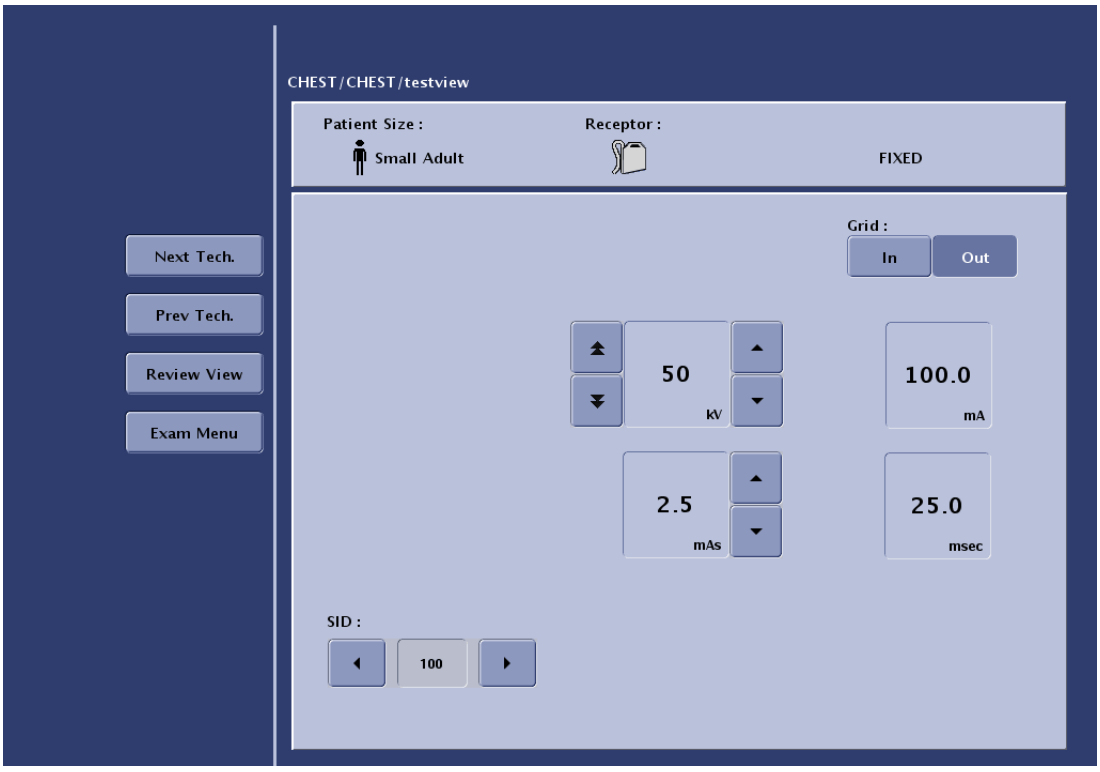
Figure A7-31 Edit Techniques screen



19. Change the technique parameters as appropriate.

CAUTION: If no technical factors are present in the system, the default settings are:

- **kV = 50**
- **mA = 100 (fixed setting)**
- **mAs = .05**

No exposures should be made until the user selects values appropriate for the patient size.

20. Upon completion for each view, press [NEXT TECH] adjust techniques for the next configured patient size.
21. When finished, press [EXAM MENU].
    - The Exam Menu appears.
22. Press [SAVE].
    - A message appears: "Changes made to the Protocol Database will be saved."
    - [RESET] clears all changes to the database since the last time it was saved.
23. Press [OK].
    - The Preferences – Protocols screen appears.

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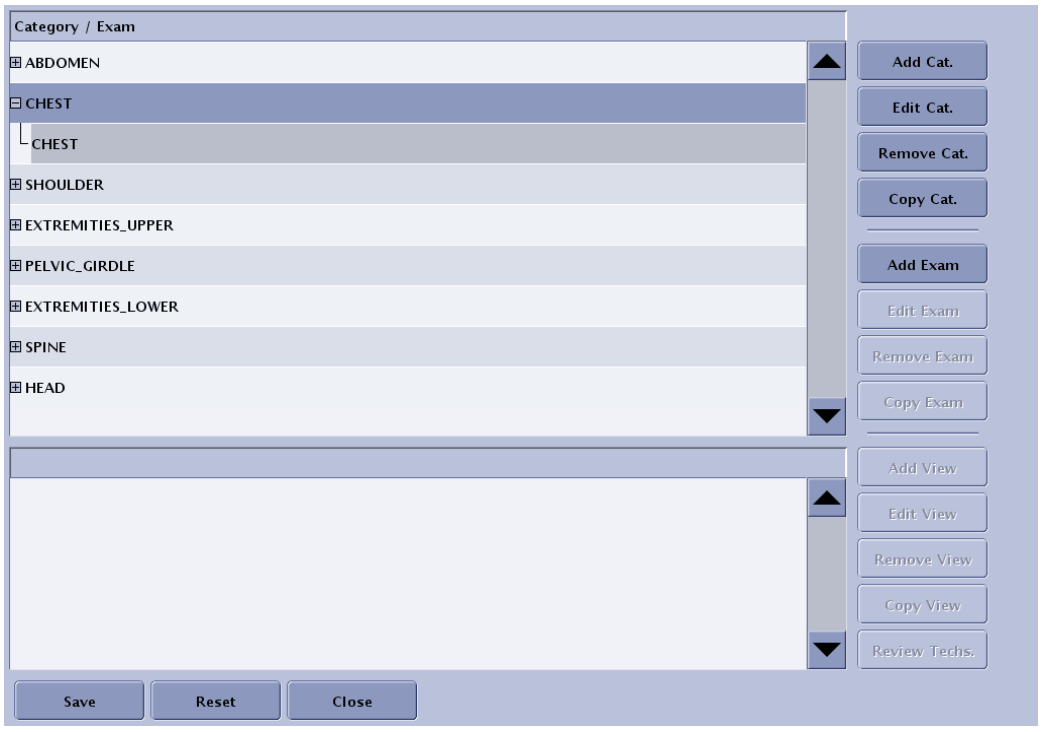
24. Press [CLOSE].
    - A message appears: "Changes have been made to the Protocol Database. Would you like to save these changes?"
25. Press [YES].
    - The Exam Menu screen closes and returns you to the Preferences - Protocols screen.

Protocol Editor Copy Functions

Follow this process to access the Protocol Database Editor.

1. From the Worklist, select [UTILITIES].
2. Select **Preferences > Protocols**.
3. Press [EDIT].
    - The Exam Menu appears.

Figure A7-32 Exam Menu



4. Continue with Copy Category (p. A7-49), Copy Exam (p. A7-50), or Copy View (p. A7-50).

Copy Category

1. Select the Category to copy
2. Press [COPY CAT].
3. Enter the new name to use or retype the existing name

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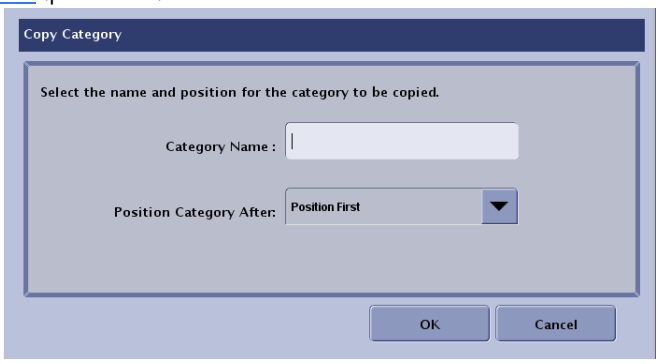
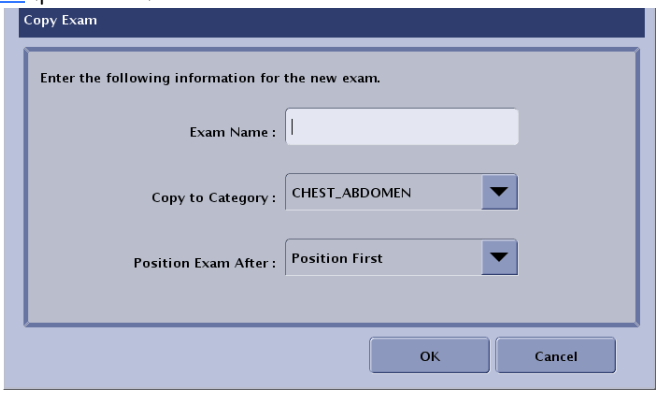
NOTE: If reusing the existing name, be sure to include any underscores in the title.

4. Select the **position** on the Category list.
5. Press [OK].
6. Continue with Copy Exam (p. A7-50).



Copy Exam

1. Select the Exam to copy.
2. Press [COPY EXAM].
3. Enter the new name to use or retype the existing name.
4. Select the **Category** to copy to.
5. Select the position on the **Exam** list.
6. Press [OK].
7. Continue with Copy View (p. A7-50).



Copy View

1. Select the View to copy.
2. Press [COPY VIEW].
3. Enter the **Exam Name** to use or retype the existing name.
4. Select the **Copy to Category** from the list.

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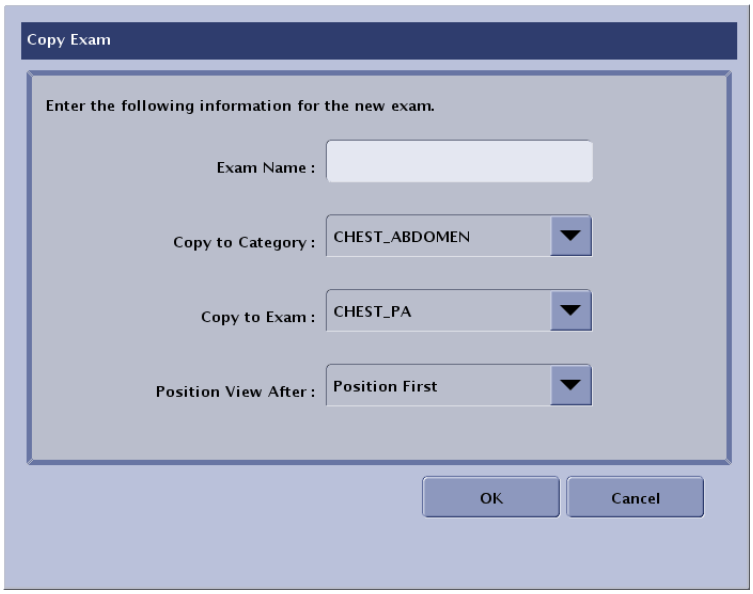
5. Select the **Copy to Exam** from the list.
6. Select the **Position View** from the list.
7. Press [OK].



NOTE: Remember to back up the database when finished editing. Refer to Backup Protocol Database to CD (p. A7-40) for more information.

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Chapter A8: Quality Assurance Process and Maintenance

This chapter explains the Quality Assurance and Maintenance process for the GE Portable DR Detector. To assure continued performance of the GE Portable DR Detector, a periodic inspection program must be established. Daily functional checks should be part of this program.

The Quality Assurance Process (QAP) consists of a series of tests that should be performed weekly on your system to quantify image quality. Many of the background tasks in this procedure have been automated and require the acquisitions to be performed in the prescribed order.

Topics covered include:

- Types of Quality Tests (p. A8-1)
- When to Perform Quality Tests (p. A8-2)
- Quality Test Preparation (p. A8-2)
- Perform Detector Check (p. A8-3)
- Perform QAP (p. A8-5)
- Result History (p. A8-11)
- Maintenance and Cleaning (p. A8-12)

Types of Quality Tests

There are two types of quality tests:

- Detector Check: A quick test to check detector quality if the detector was dropped. Detector Check does not require making exposures and the pass or fail results are not included in the results history. The Detector Check test can be performed in approximately 30 seconds.
- QAP: A full QAP test that requires taking exposures of a flat field phantom. The results (pass or fail) are recorded in a results history summary for service personnel review. The QAP test can be performed in approximately 15 minutes.

  The QAP test includes all the tests that are performed for Detector Check and tests additional factors.

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When to Perform Quality Tests

This section describes the recommended quality testing schedule and any other events that warrant quality tests to be performed

Detector Check

Detector Check is used daily to check detector quality and anytime after an accidental drop.

After a detector drop, the system reports an error and displays a QAP alert icon (Figure A8-1) to indicate that you should conduct a Detector Check test on the detector.

The Detector Check alert icon will remain until a Detector Check or QAP test is run.

QAP

QAP should be performed:

- On a scheduled, weekly basis.
- When the alert icon appears on the QAP button (Figure A8-1).
- When there is a perceived loss of image quality.

NOTE: When scheduling QAP tests, plan 15-20 minutes to perform the test. One portion of the test requires that the system be powered on and in an idle state (i.e., without exposures) for at least 10 minutes. The 10 minute idle period is based upon the time from the last exposure prior to performing QAP or system start up. The rest of the test requires approximately 5 minutes to complete.

Figure A8-1 QAP button with alert icon

Quality Test Preparation

Before starting quality tests, be sure to do the following:

- Close or suspend any open exams
- Close any exam being reviewed
- Clear all objects from detector and beam path (QAP only)
- Disconnect the unit from the charging outlet (exposures are not permitted while the unit is charging)

The QAP process begins when the QAP button is clicked. The button is located at the bottom of the Worklist or Acquisition screen.

NOTE: QAP cannot be performed if an exam is open or being reviewed.

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Perform Detector Check

Follow this process to perform a Detector Check.

1. Press the [QAP] button at the bottom of the Worklist or Acquisition screen.
   - The Image Quality screen appears.

Figure A8-2 Image Quality screen

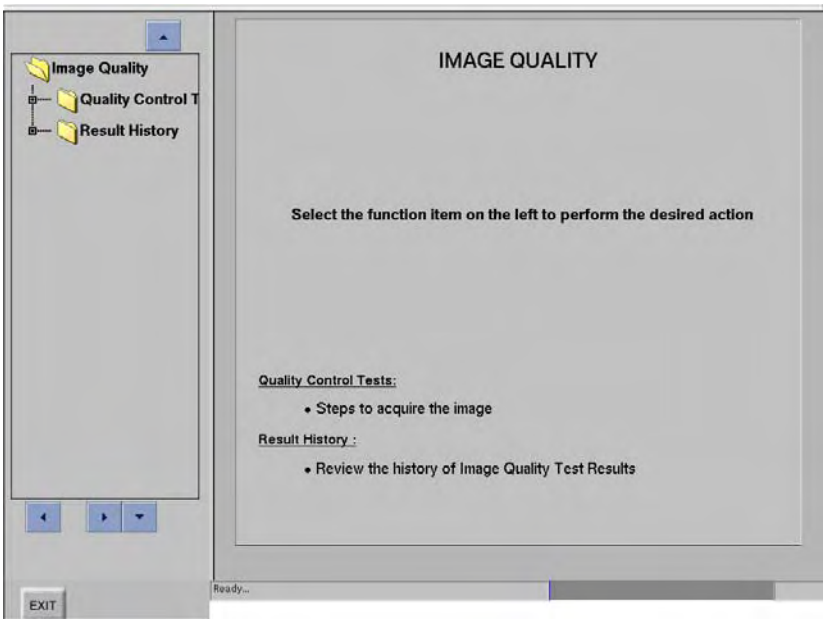
Image Quality
Quality Control T
Result History
IMAGE QUALITY
Select the function item on the left to perform the desired action
Quality Control Tests:
• Steps to acquire the image
Result History :
• Review the history of Image Quality Test Results
EXIT
Ready...

2. Select **Quality Control Tests** from the left side of the screen (Figure A8-3).

Figure A8-3 QAP selection from left side of screen

   - The Quality Assurance Program screen appears.

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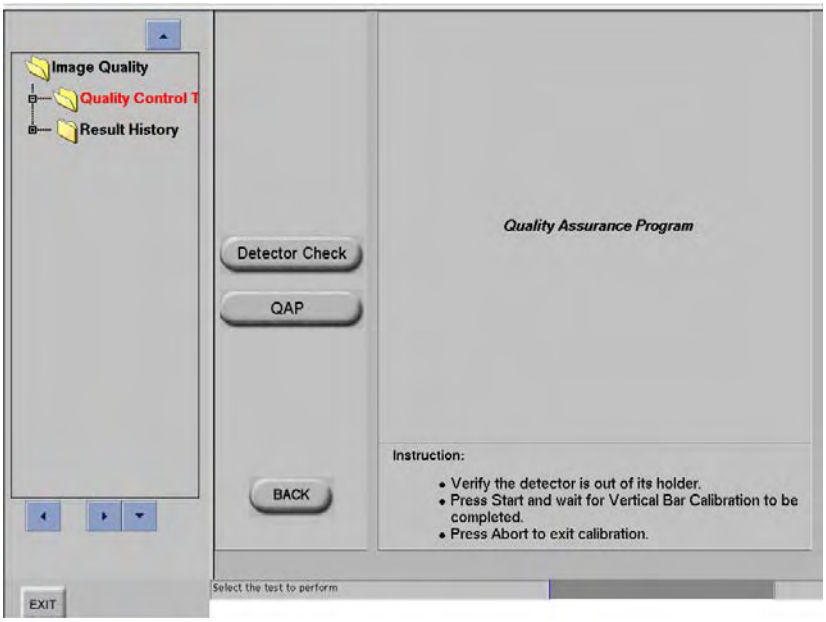
Figure A8-4 Quality Assurance Program screen



3. Press [DETECTOR CHECK].
   - The Detector Check Tests screen appears.

Figure A8-5 Detector Check Tests screen

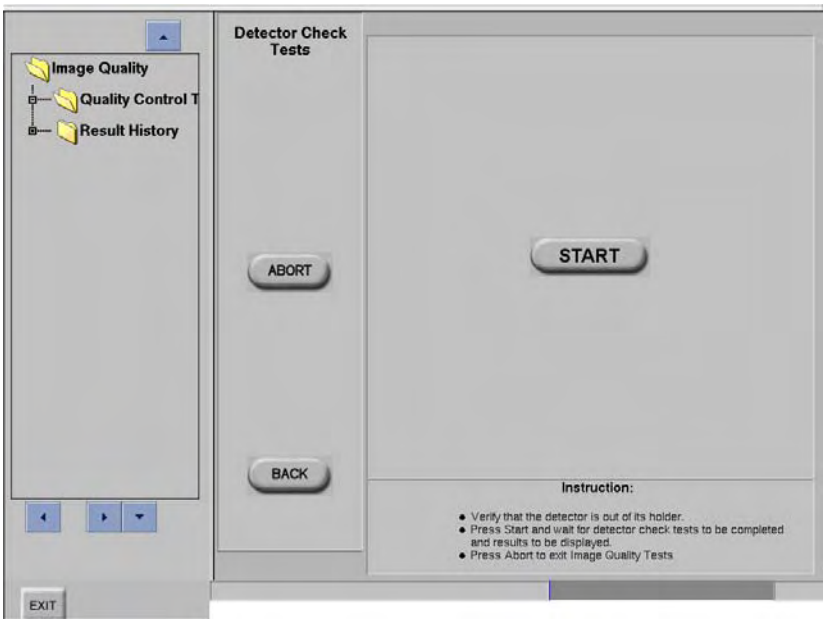


Image Quality
Quality Control T
Result History
Detector Check Tests
ABORT
BACK
EXIT
START
Instruction:
• Verify that the detector is out of its holder.
• Press Start and wait for detector check tests to be completed and results to be displayed.
• Press Abort to exit Image Quality Tests

4. Press [START] to begin the Detector Check.
5. Wait for the test to complete.
   - The Detector Check result screen appears automatically after tests have been completed.

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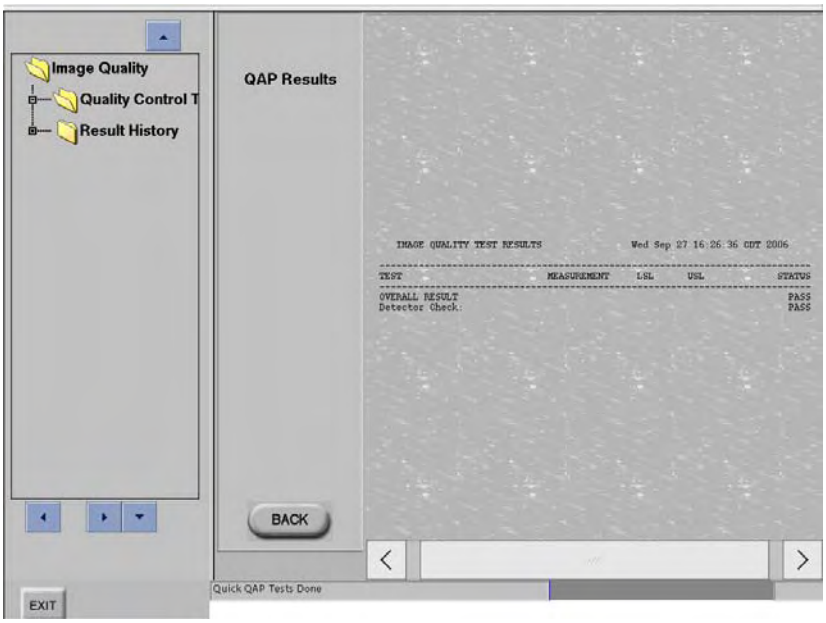
Figure A8-6 Detector Check results screen

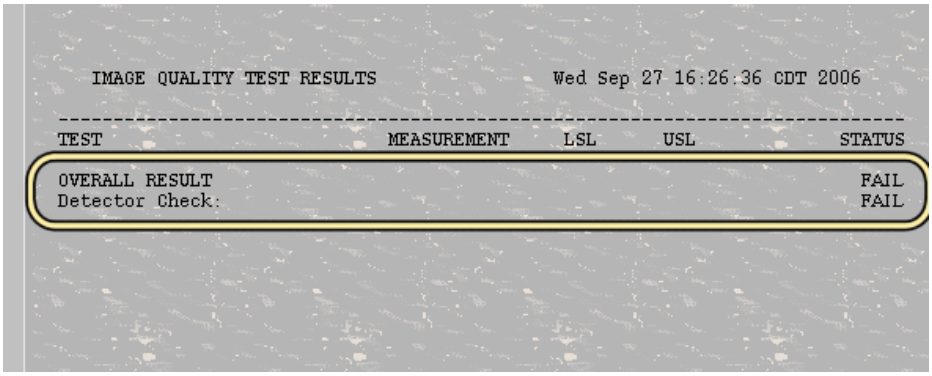


Failed Detector Check

If the system fails the Detector Check (Figure A8-7), call to schedule service. The system is operational, although inspection and potential calibration are needed.

WARNING: Image quality may be degraded if you continue to use a detector that has failed the Detector Check tests.

Figure A8-7 Failed Detector Check results



Perform QAP

QAP involves tests requiring exposures with the flat field phantom. The GE Portable DR Detector QAP kit includes a flat-field phantom (Figure A8-8) sized to fit the collimator.

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QAP tests require that the system be on, be idle, and that the detector not be in power save mode for at least 10 minutes.

IMPORTANT!: **Do not** use the control and display panel to change the exposure settings when performing QAP. The exposure techniques for this calibration are automatically set up by the calibration software. These techniques are required for proper calibration and should not be changed by the user.

Figure A8-8 Flat-field phantom

Follow this process to perform a QAP test.

1. Press the [QAP] button at the bottom of the Worklist or Acquisition screen.
   - The Image Quality screen appears.

Figure A8-9 Image Quality screen

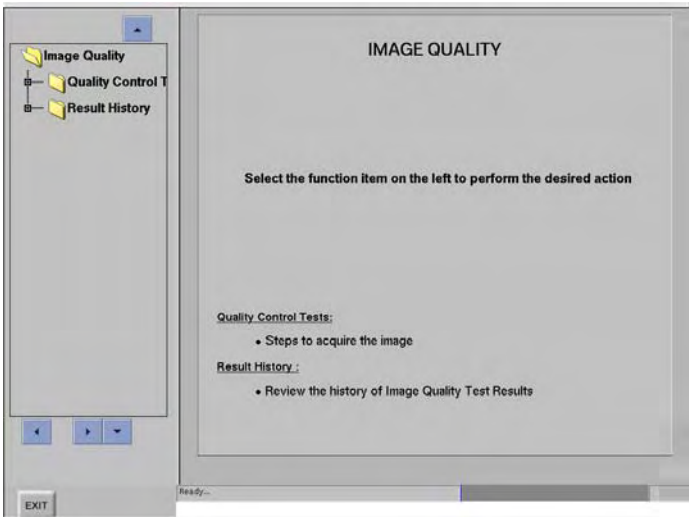
Image Quality
Quality Control T
Result History
IMAGE QUALITY
Select the function item on the left to perform the desired action
Quality Control Tests:
• Steps to acquire the image
Result History :
• Review the history of Image Quality Test Results
EXIT

2. Select **Quality Control Tests** from the left side of the screen (Figure A8-10).

Figure A8-10 QAP selection from left side of screen

   - The Quality Assurance Program screen appears.

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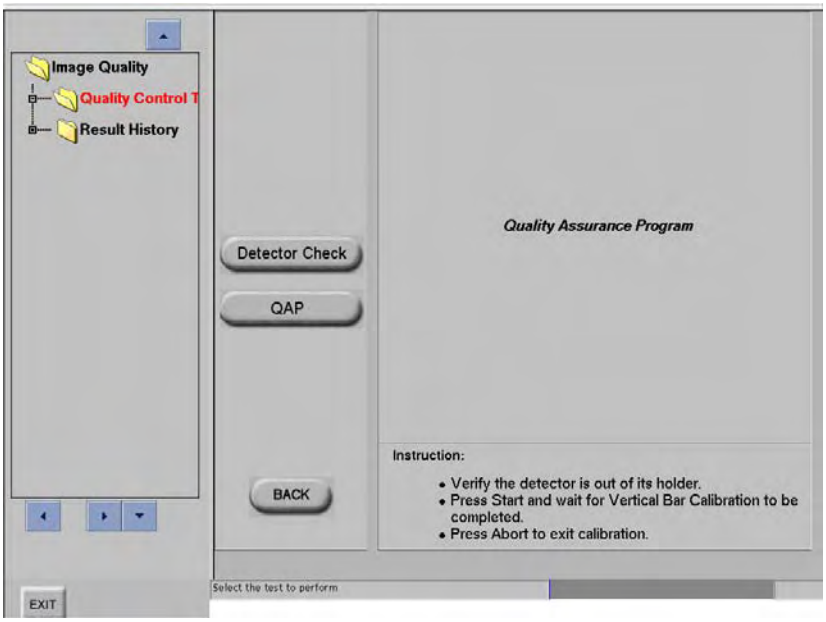
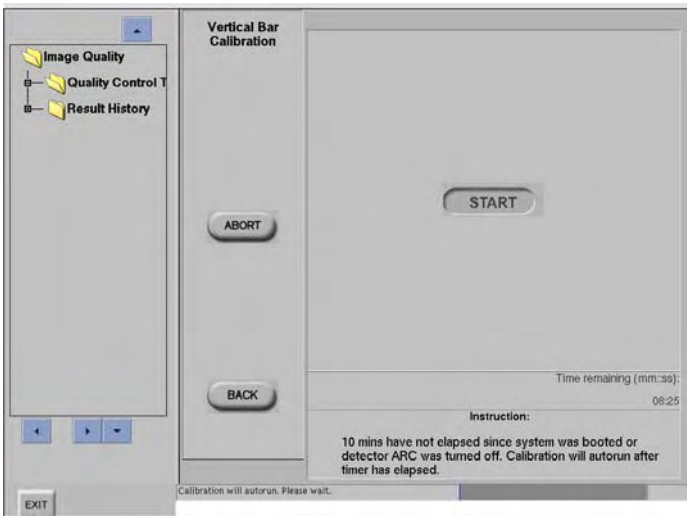
Figure A8-11 Quality Assurance Program screen



3. Press [QAP].
   - The Vertical Bar Calibration screen appears.
4. Press the [START] button to begin the Vertical Bar Calibration test.

NOTE: QAP requires that the system be in an idle state (without exposures) for at least 10 minutes before the Vertical Bar Calibration portion of the test can begin. If the system has not been idle, a countdown timer appears on the bottom of the screen and Vertical Bar Calibration will begin automatically when the specified time has been reached.

Figure A8-12 Vertical Bar Calibration screen



5. Wait for the test to complete.
   - The Detector Check Tests screen appears.

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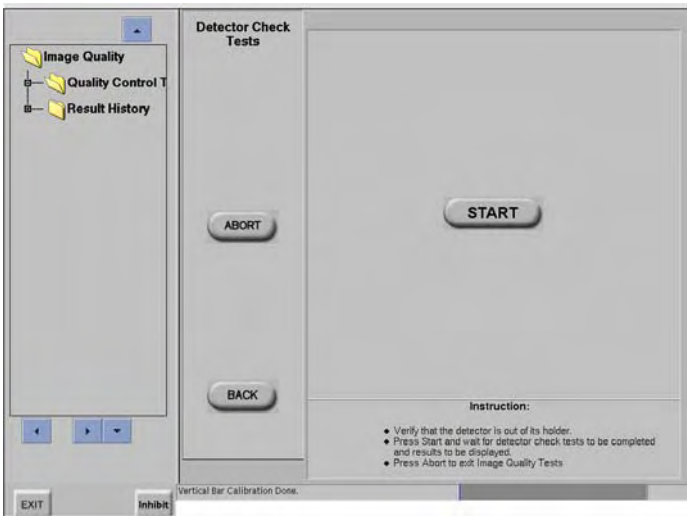
6. Follow the instructions on screen to complete this portion of the test:

Figure A8-13 Detector Check Tests screen



a) Verify that the detector is out of its holder.

b) Press [START] and wait for the detector check tests to be completed and results to be displayed.

- The Detector QC Tests screen appears automatically when the Detector Check Tests are complete.

7. Follow the instructions on screen to complete this portion of the test:

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Figure A8-14 Detector QC Tests screen

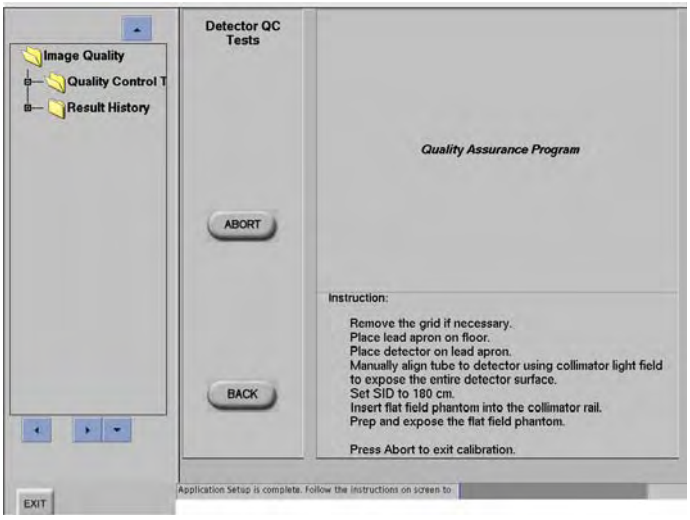
Image Quality
Quality Control T
Result History
Detector QC Tests
Quality Assurance Program
ABORT
BACK
Instruction:
Remove the grid if necessary.
Place lead apron on floor.
Place detector on lead apron.
Manually align tube to detector using collimator light field to expose the entire detector surface.
Set SID to 180 cm.
Insert flat field phantom into the collimator rail.
Prep and expose the flat field phantom.
Press Abort to exit calibration.
EXIT
Application Setup is complete. Follow the instructions on screen to

a) Place lead apron on floor.

b) Place detector on lead apron.

c) Manually align tube to detector using collimator field light to expose the entire detector surface.

d) Insert flat field phantom into the collimator rail.

e) Remove the grid if necessary.

f) Set SID to 180 cm.

g) Prep and expose the flat field phantom.

- The Detector QC Tests screen updates to show a [START] button.

8. Press [START] to begin Flat-field Tests.
   - The Flat-field tests screen appears.
9. Follow the instructions on screen to complete this portion of the test:
   a) Do not reposition the system.
   b) Prep and expose the flat field phantom.
   - The acquired preview image automatically appears after exposure.
10. Press anywhere on the screen to close the Preview and return to the QAP screen.
11. Prep and expose the flat field phantom again.
    - The acquired preview image automatically appears after exposure.
12. Press anywhere on the screen to close the Preview and return to the QAP screen.
    - The QAP result screen (Figure A8-15) appears automatically after tests have been completed.

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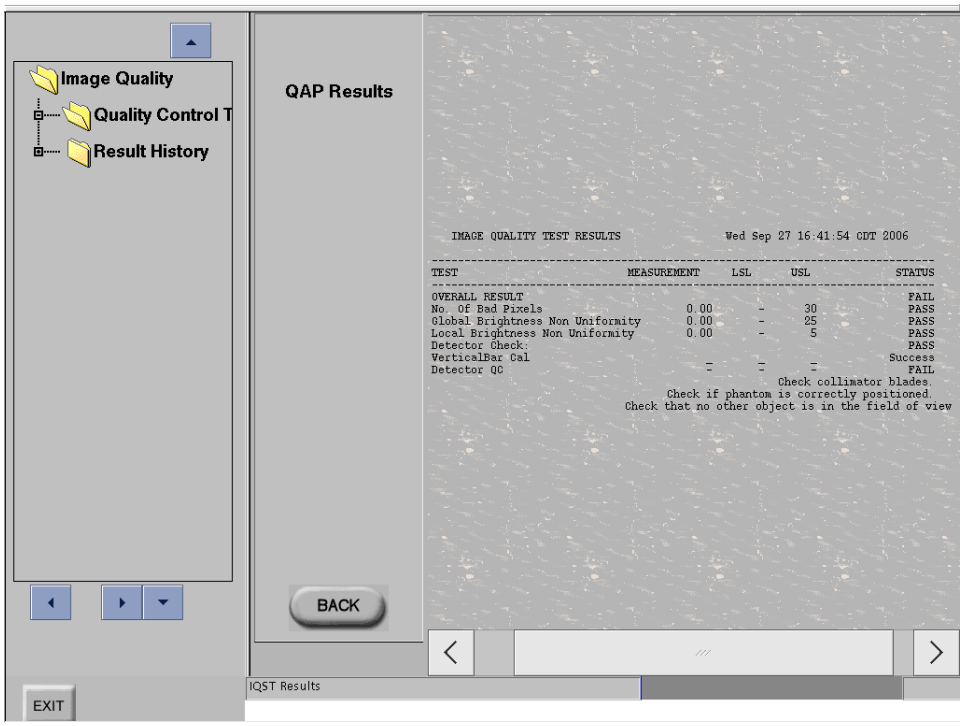
13. Review the Status (far right column) of each test.
    - If all tests PASS: QAP is complete. Click [EXIT] to return to the Worklist screen and continue work.
    - If some tests FAIL: Refer to Failed QAP (p. A8-10) for more information.

Figure A8-15 QAP Results screen



Failed QAP

In the event of failed QAP tests, wait 10 minutes and repeat the QAP procedure to confirm the failure. Check the items listed below when repeating the tests:

- Check collimator blades. Make sure that they are fully open and not in the field of view.
- Check that the phantom is correctly positioned.
- Check that no other objects are in the field of view.

If a single failure is confirmed, call to schedule service. The system is operational, although inspection and potential calibration are needed.

If multiple failures are confirmed, image quality may be affected; cease use of the unit and call for immediate service.

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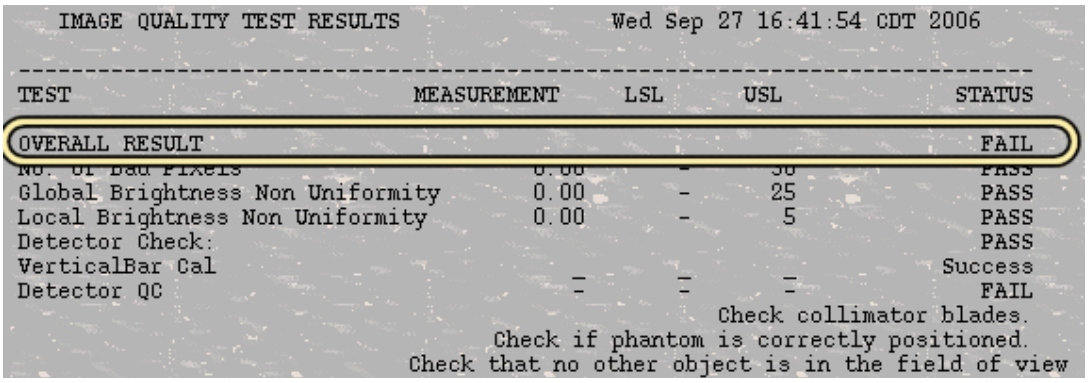
Figure A8-16 Failed QAP results



Result History

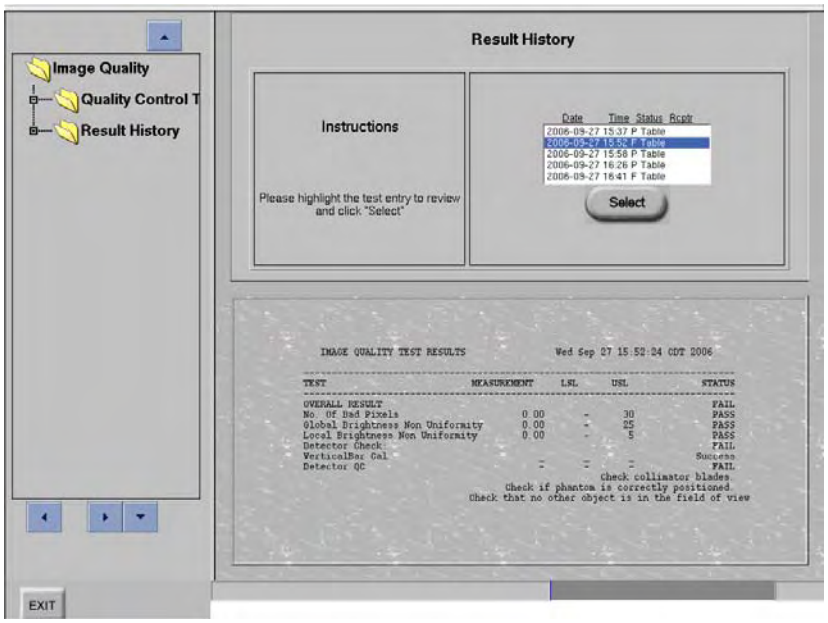
After QAP is complete, the system generates a test summary page. The result summary table contains descriptive names, measured values, test specifications (LSL and/or USL) and pass/fail status.

A minimum of 25 QAP test results are maintained.

Follow this process to view the results of previous QAP tests.

1. From the left pane, press [RESULT HISTORY].
   - The Result History screen appears.
2. Press a test entry in the list to select it.
3. Press [SELECT].
   - The test details appear.

Figure A8-17 QAP Result History screen



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Maintenance and Cleaning

Periodic Maintenance by Service Personnel

To ensure the continued safe performance of your GE Portable DR Detector, establish a periodic maintenance program with a qualified service representative.

Periodic maintenance checks are required thirteen months after installation and every year thereafter. A periodic maintenance schedule and a sample mAs/kVp accuracy chart are provided on the following pages.

As the manufacturer of the GE Portable DR Detector, GE accepts no responsibility for safety, reliability or performance unless:

- Assembly, calibration and repairs are performed by a GE authorized representative according to the corresponding GE Portable DR Detector manuals.
- Any modification, addition or deletion to this system is authorized specifically by GE, in writing.
- Electrical installation complies with the IEC regulations.
- The device is used in accordance with the Operating Instructions.
- Original or authorized spare parts are used.

If service of the unit is performed, the service technician must provide an official service report describing the type and extent of repair. This service report must contain all information regarding changes to nominal data and/or work range performed at the service visit. The service report must also indicate the date of repair, the name of the company carrying out the repair and a valid signature. The user should keep this service report in a safe place for future references.

Preventative Maintenance

Visually inspect the detector for signs of damage. Damage includes cracks in the magnesium or graphite covers, dents, and scratches to the graphite cover deeper than 1.0mm.

Inspect the tether for wear (fraying, jacket tears) and replace if necessary.

Visually inspect the grid for signs of damage. This may include dents to the frame (>2mm indentation) or signs of impact to the grid surface. Replace if necessary.

1.

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Cleaning and Disinfecting

This equipment should be cleaned frequently, particularly if corroding chemicals are present. Use a cloth moistened in warm soapy water (use mild soap) to clean the trim and nameplate of the Operator's Controls. Wipe with a cloth moistened in clean water.

Do not use cleaners or solvents of any kind as they may dull the finish or blur the lettering. Polish with a pure liquid or paste wax. Other surfaces of the equipment can be cleaned using a clean cloth moistened slightly with a good mild cleaner and polish acceptable for use on enameled metal surfaces. Before each use, equipment surfaces that contact the patient should be cleaned with an EPA registered, low-level disinfection or sanitizing agent.

CAUTION: In the event of equipment contacting broken skin or being used with infected or immune compromised patients, the equipment should be cleaned using EPA cleared and EPA registered high-level disinfecting agents.

NOTE: Be sure to follow the label instructions and pre-cautions for use, storage, and disposal of all disinfecting agents.

NOTE: Clean the surface of the PC with a damp cloth.

Detector Cleaning

All exterior surfaces should be cleaned after each exam.

- Refer to Chapter A1: Detector Overview-Cleaning (p. A1-10) for more information about cleaning the GE Portable DR Detector and its accessories.
- Refer to Chapter 7: Maintenance and Service-Cleaning the Unit (p. 7-1) for information about cleaning the surface of the Definium AMX 700.

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Appendix B: Login Administration

In the effort to provide aid for our customers in complying with the Health Insurance and Portability and Accountability Act (HIPAA), the Enterprise Access Authorization and Audit (EA3) control features have been implemented in this product. It is the facility's responsibility to ensure the proper usage of these features in order to conform to the Privacy Act.

Topics covered include:

- Enabling EA3 Login (p. B-1)
- Understanding Local and Enterprise Environments (p. B-2)
- Understanding Privileges, Groups, and Users (p. B-2)
- Administering Groups and Users (p. B-3)
  - Accessing the Login Administration Screens (p. B-3)
  - Working with Groups (p. B-4)
    - Add Groups (p. B-4)
    - Assign Privileges to Groups (p. B-5)
    - Remove Groups (p. B-5)
    - Show Protected Groups (p. B-5)
  - Working with Users (p. B-7)
    - Add Users (p. B-7)
    - Assign Users to Groups (p. B-8)
    - Change User Password (p. B-8)
    - Remove Users (p. B-9)
    - Show Protected Users (p. B-9)
- Viewing the Audit Log (p. B-11)
- Administering System Configuration (p. B-12)
  - Change Display Settings and Enable Enterprise Authorization (p. B-12)
  - Configure Enterprise Authorization (p. B-13)
  - Configure Audit Log (p. B-15)
  - Use LDAP Console (p. B-16)

Enabling EA3 Login

On the Service User Interface, click on the Configuration Tab and select the Advanced Options. Click on the Radio Buttons available to Enable/ Disable the HIPAA option. By default the HIPAA option is disabled.

The Login feature can be turned on or off by your GE Field Engineer.

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Understanding Local and Enterprise Environments

The login function may be administered at either a local or enterprise level.

Local (or stand-alone) login administration is for a piece of equipment or information system to have its own set of login names and passwords. Each local system needs to have users with admin access set up to administer the login function. From the user's perspective, he or she needs a login name and password for each piece of equipment and information system necessary to perform his or her job.

Enterprise login administration is to use the site's existing login names and passwords to allow access to multiple pieces of equipment and information systems throughout the site. The login function is administered centrally by the site's system administrator because each system sends and receives login information over the network. From the user's perspective, he or she only needs one login name and password to access all equipment and systems necessary to perform his or her job.

For mobile units in an enterprise environment, login information is sent and received only when the unit is connected to the network.

Understanding Privileges, Groups, and Users

Privileges are the rights to access a system or piece of equipment and perform certain functions. Privileges are assigned to groups. The privileges are created by GE and cannot be changed. They are:

- **GE Service** allows access to all functions for service and maintenance personnel.
- **Administrator** allows access to the Login administration and Preferences functions in addition to being able to add procedures to the Worklist, conduct exams, and manage images.
- **Standard and Limited User** only allows access to add procedures to the Worklist, conduct exams and manage images.

Groups are categories of users that have certain privileges assigned. Users get their privileges from groups. A user may be assigned to several groups. Groups are created and assigned privileges by a user with GE Service or Administrator access. If you do not have an enterprise system, the assignment of group privileges will probably be limited to those who have administrator privileges and those who don't. If your system is set up for enterprise login, your IT person or administrator will be using more of the features.

When equipment is installed in an enterprise environment, the administrator configures the enterprise groups that the equipment will use. That is, the enterprise environment will have groups for many levels of access and job descriptions, the administrator will set the individual piece of equipment to use a sub-set of those groups.

Users are individuals who have permission to use a particular system. Users are created and assigned to groups by a user with GE Service or Administrator access. These administrators may be IT personnel in an enterprise environment, or a site manager or lead tech in stand-alone environments. The administrator adds new users and assigns the users to a group which dictates the level of privileges a person will have. For example, a person named Sue Smith could belong to a group called technologists, radiologists, administrators, or any combination.

When configuring a system (enterprise or local) always create the groups and assign group privileges first, then add individual users to the groups.

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Administering Groups and Users

This section describes how to perform the tasks relating to administering the login function.

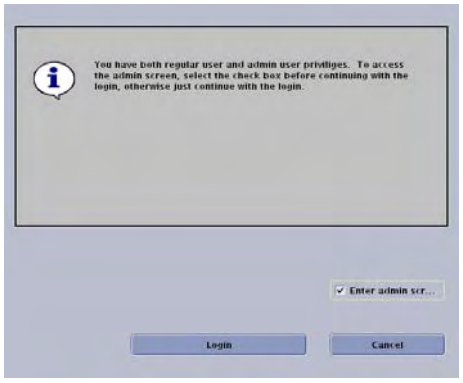
Accessing the Login Administration Screens

Follow this process to gain access to the login administration screens.

Follow this process to log on to the system.

1. Start up the system or log off the previous user.
   - The Login screen appears.
2. Type in your **Login Name**.
3. Type in your **Password**.
4. Click [LOGIN].
   - If you have administrator access, a message (Figure B-1) appears: "You have both regular user and admin user privileges. To access the admin screen, select the check box before continuing with the login, otherwise just continue with the login."
   - If the message does not appear, then you do not have access to the login administration functions.
5. Select the **Enter admin screen** checkbox.
6. Click [LOGIN].
   - The Login Administration screen appears.
   - [CANCEL] closes the message and returns you to the main Login screen.
7. Click [EXIT] on the bottom of any login administration screen to return to the standard login screen.

Figure B-1 Administrator access message


You have both regular user and admin user privilges. To access the admin screen, select the check box before continuing with the login, otherwise just continue with the login.
Enter admin scr...
Login
Cancel

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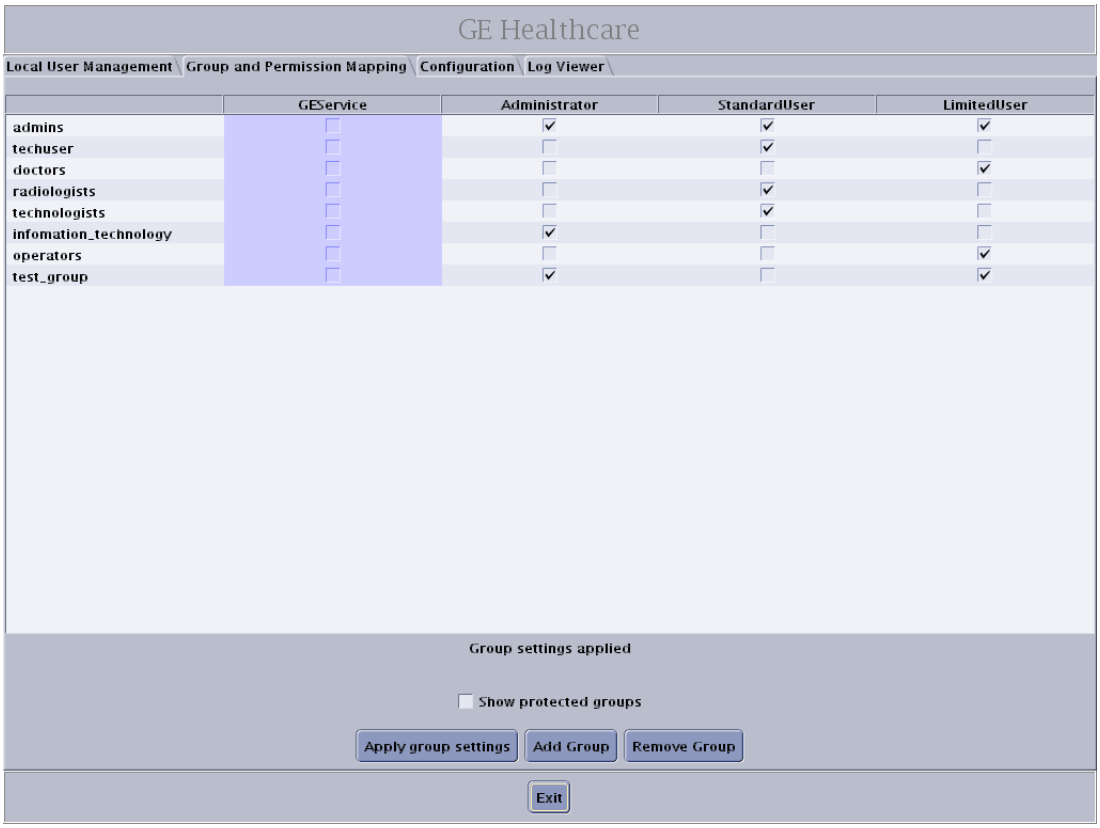
Working with Groups

The Group and Permissions Mapping tab (Figure B-2) allows you to add groups, remove groups, and assign privileges to groups. On this screen, the four privileges categories are at the top of the screen (columns) and the group names are at the left edge of the screen (rows).

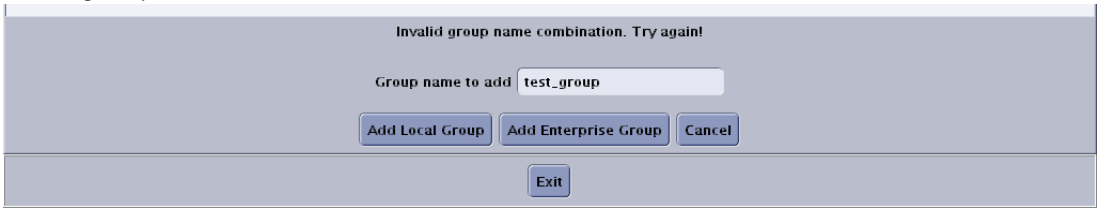
Figure B-2 Group and Permissions Mapping tab



Add Groups

1. Select the **Group and Permissions Mapping** tab, if necessary.
2. Click [ADD GROUP].
3. Type a name for the group in the text box that appears near the bottom of the screen (Figure B-3).

Figure B-3 Add group text box



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NOTE: Remember the following when creating group names:

- Group names cannot have spaces or uppercase (capital) letters. Use all lowercase letters in the group name and use underscores to separate words.
- The group name must be unique. That is, the system will not allow two groups to have the same name.

4. Click [ADD LOCAL GROUP] or [ADD ENTERPRISE GROUP] as appropriate.
   - The new group name is added to the table.
   - If the group name cannot be used you will receive a message that informs you of the problem. Type the correct information and click [SUBMIT] again.

Assign Privileges to Groups

1. Click a group name to select it.
2. Select the checkbox under the privilege heading. Refer to Understanding Privileges, Groups, and Users (p. B-2) for definitions of privileges.

NOTE: The Service privilege is protected and cannot be selected. Only GE Service personnel can assign a group to the Service privilege.

3. Click on a selected checkbox to remove the privilege.

NOTE: You may select or deselect privileges for multiple groups.

4. Click [APPLY GROUP SETTINGS].
   - A message appears: “Apply group settings.”
5. Click [APPLY NOW].

Remove Groups

1. Click a group name to select it.

NOTE: You are able to only delete one group at a time.

2. Click [REMOVE GROUP].
   - A message appears: “Remove Group (name)?”
3. Click [REMOVE NOW].

Show Protected Groups

There is a class of groups identified as protected groups. The privileges assigned to these groups can only be modified by a GE Service Engineer.

Select the **Show Protected Groups** checkbox to see these groups. Protected groups and privileges are shown with a violet (light purple) background.

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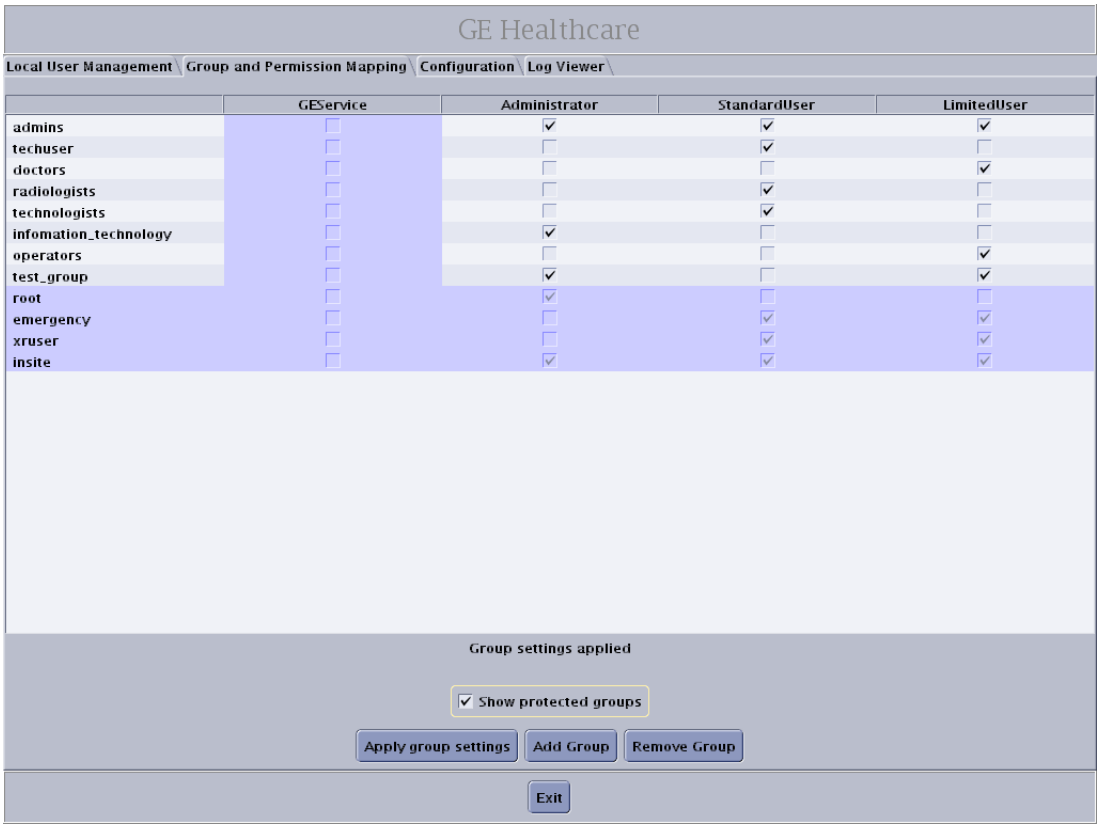
Figure B-4 Protected groups



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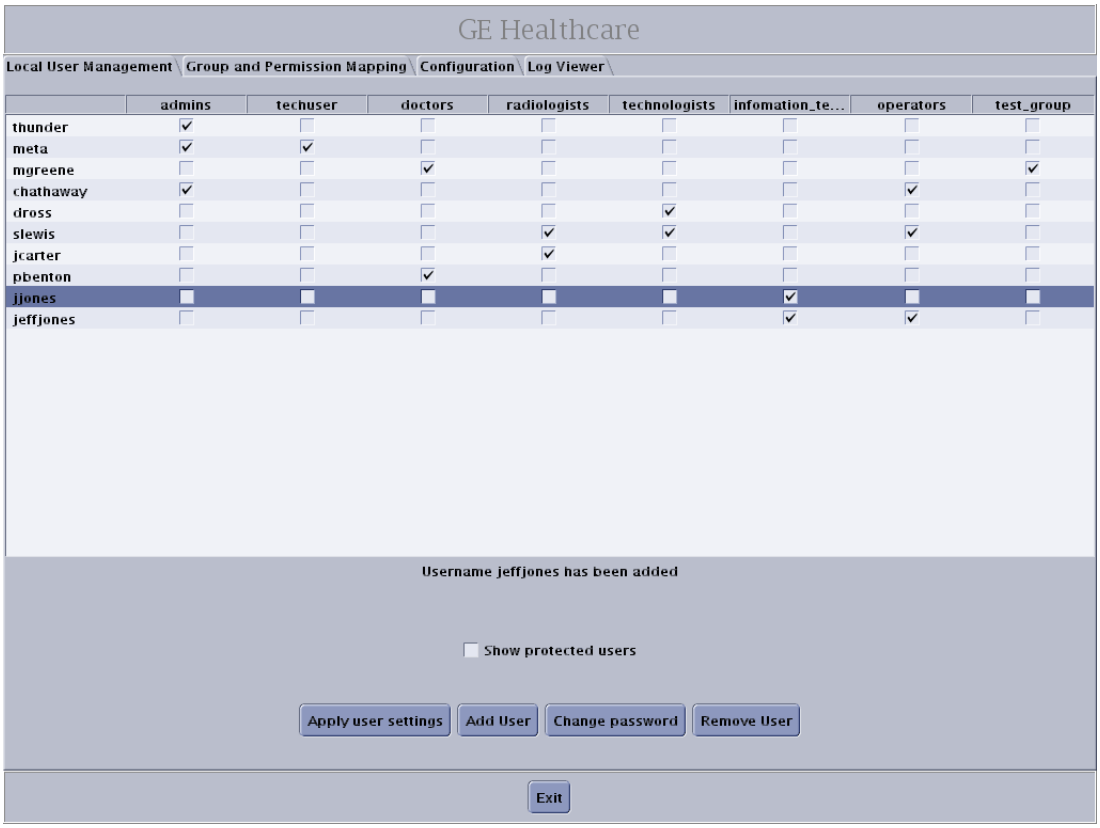
Working with Users

The Local User Management tab (Figure B-5) allows you to add users, assign users to groups, change user passwords, and remove users. On this screen, the available groups are at the top of the screen (columns) and the user names are on the left edge of the screen (rows).

Figure B-5 Local User Management tab



Add Users

1. Select the **Local User Management** tab, if necessary.
2. Click [ADD USER].
   - Five text boxes appear near the bottom of the screen (Figure B-6).

Figure B-6 Add user text boxes

3. Type a Username.

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NOTE: Remember the following when creating user names:

- You cannot use the names “operator”, “admin”, or “administrator.” These names are reserved for use by the system and GE Service personnel.
- User names cannot have spaces or uppercase (capital) letters. Use all lowercase letters in the username and use underscores to separate words.
- User names cannot have special characters: ~!@#%^&*()+=[]{}\|:;'",.<>/?
- The User name must be unique. That is, the system will not allow two people to have the same user name.

4. Type the user’s First Name.
   - This text box may be left blank but it is recommended that you type a name.

NOTE: Capital letters, spaces, and punctuation are allowed in the First Name and Last Name text boxes.

5. Type the user’s Last Name.
   - This text box may be left blank but it is recommended that you type a name.
6. Type a Password.

NOTE: The default system does not have pre-configured standards for password format or construction; however, your facility may have password standards that must be followed. Ask your facility’s System Administrator about password standards and create passwords that conform to those standards.

7. Re-type the password in the Confirm Password text box.

NOTE: The passwords must match exactly to be accepted.

8. Click [SUBMIT].
   - The new user is added to the table.
   - If the Username cannot be used or if the passwords do not match, you will receive a message that informs you of the problem. Type the correct information and click [SUBMIT] again.

Assign Users to Groups

1. Select the checkbox under the group heading to add the user to that group.
2. Click on a selected checkbox to remove the user from the group.

NOTE: You may select or deselect groups for multiple users.

NOTE: You cannot change the group assignments for protected users.

3. Click [APPLY USER SETTINGS].

Change User Password

You cannot see user’s passwords for security reasons. In the event of a forgotten password, you may change the password and then tell the user the new password.

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1. Click a user name to select it.
2. Click [CHANGE PASSWORD].
   - The Password and Change Password text boxes appear.

Figure B-7 Change password

3. Type a password into the New Password field.

NOTE: The default system does not have pre-configured standards for password format or construction; however, your facility may have password standards that must be followed. Ask your facility's System Administrator about password standards and create passwords that conform to those standards.

4. Re-type the password into the Confirm Password field.
5. Click [SUBMIT].

Remove Users

1. Click a user name to select it.

NOTE: You cannot delete protected users.

2. Click [REMOVE GROUP].
   - A message appears: "Remove User xxx?"
3. Click [REMOVE NOW].

Show Protected Users

There is a class of users identified as protected users. The privileges assigned to these users can only be modified by a GE Service Engineer.

Select the **Show Protected Users** checkbox to see these users. Protected users and groups are shown with a violet (light purple) background.

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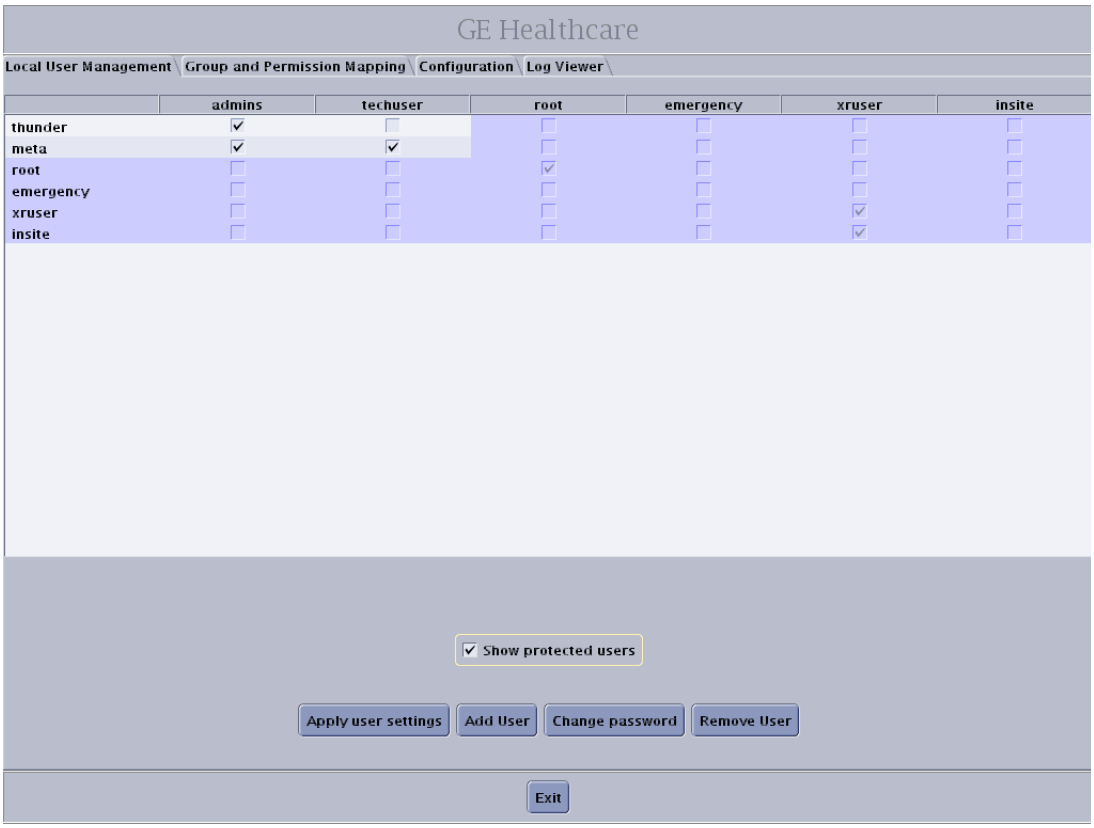
Figure B-8 Protected users



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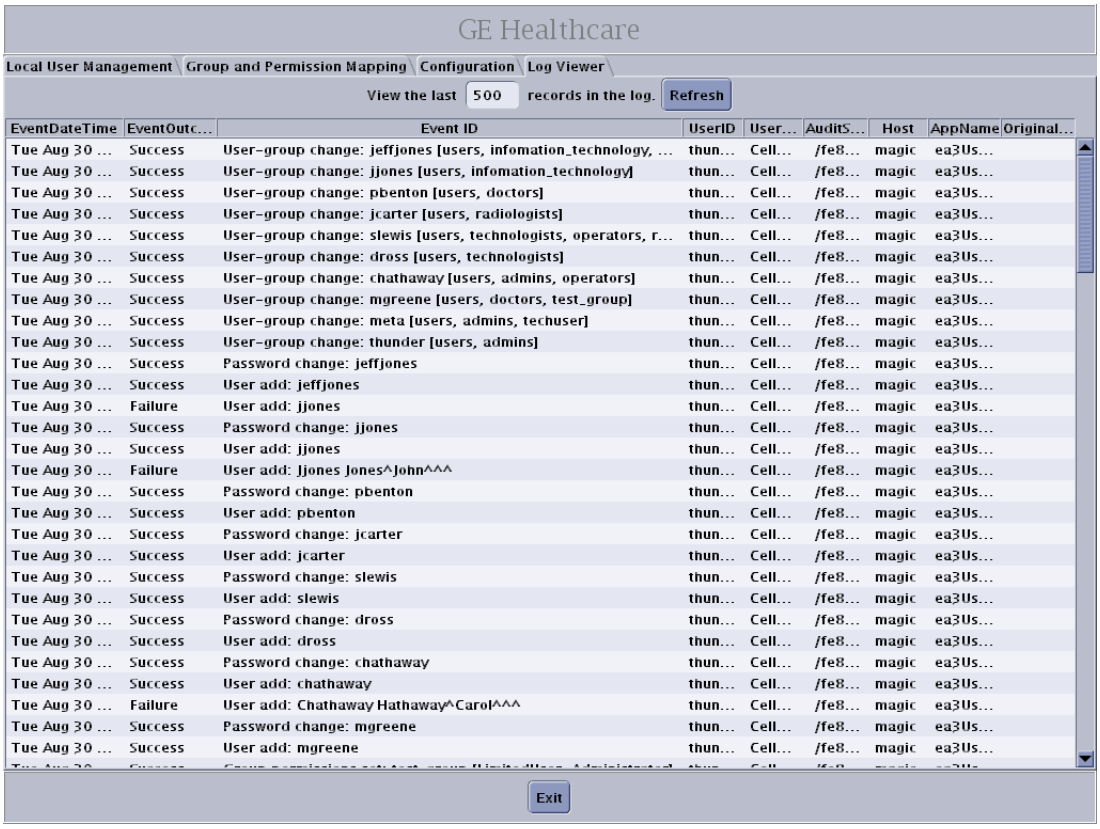
Viewing the Audit Log

The audit log provides information about who has accessed the system, when the system has been accessed, and the type of login (that is, emergency logins). The log settings are configured through the Configuration-Audit Log tab. Refer to Configure Audit Log (p. B-15) for more information.

Figure B-9 Log Viewer tab



EventDateTime	EventOutc...	Event ID	UserID	User...	AuditS...	Host	AppName	Original...
Tue Aug 30 ...	Success	User-group change: jeffjones [users, infomation_technology, ...	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User-group change: jjones [users, infomation_technology]	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User-group change: pbenton [users, doctors]	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User-group change: jcarter [users, radiologists]	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User-group change: slewis [users, technologists, operators, r...	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User-group change: dross [users, technologists]	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User-group change: chathaway [users, admins, operators]	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User-group change: mgreene [users, doctors, test_group]	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User-group change: meta [users, admins, techuser]	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User-group change: thunder [users, admins]	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	Password change: jeffjones	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User add: jeffjones	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Failure	User add: jjones	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	Password change: jjones	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User add: jjones	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Failure	User add: Jjones Jones^John^^^	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	Password change: pbenton	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User add: pbenton	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	Password change: jcarter	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User add: jcarter	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	Password change: slewis	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User add: slewis	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	Password change: dross	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User add: dross	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	Password change: chathaway	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User add: chathaway	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Failure	User add: Chathaway Hathaway^Carol^^^	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	Password change: mgreene	thun...	Cell...	/fe8...	magic	ea3Us...	
Tue Aug 30 ...	Success	User add: mgreene	thun...	Cell...	/fe8...	magic	ea3Us...	

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Administering System Configuration

The Configuration tab (Figure B-10) allows you to perform several tasks that effect how the login function works.

When the Configuration tab is selected, another row of tabs appears. The following sections describe the controls available for each tab.

Change Display Settings and Enable Enterprise Authorization

The Configuration-Configuration tab (Figure B-10) allows you to set the inactivity timeout period, control whether the Emergency Login button appears, and to enable enterprise authorization.

Table B-1 describes each function.

Figure B-10 Configuration-Configuration tab

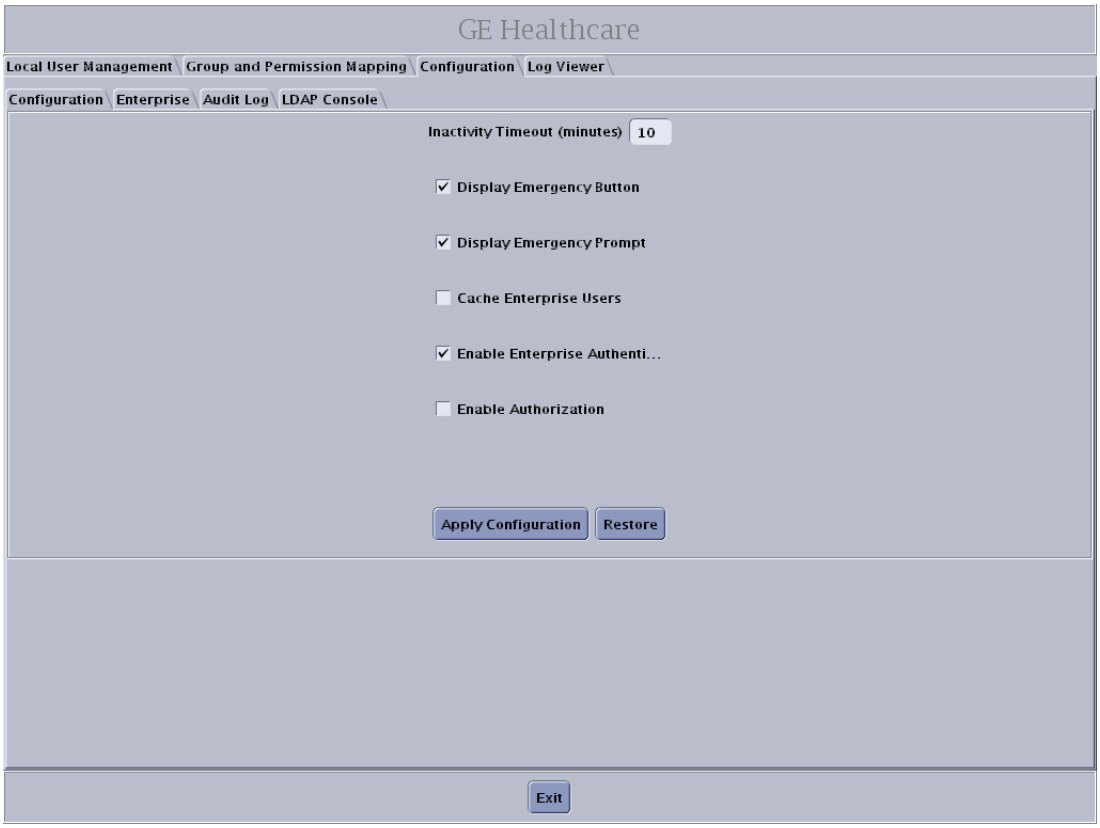

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Table B-1 Configuration function descriptions

Function	Description
Inactivity timeout	This function is not implemented for the Definium AMX 700. **IMPORTANT!:** Do not enable or change the setting on this function. Enabling or changing this function may cause conflicts with the system software. Sets the number of minutes before automatic logout will occur. For example, if you enter 10 minutes, the system will display the splash screen after 10 minutes of inactivity (no keyboard entry or mouse movements), requiring the user to log in. When logging back in, the system is returned to its last know state. To disable inactivity timeout, enter "0".
Display Emergency Button	Allows the Emergency Login button to be shown on the Login screen. If this button is not displayed, only those users with a valid account can log onto the system.
Display Emergency Prompt	When the [EMERGENCY LOGIN] button is clicked, displays a prompt that requires emergency users enter their names.
Cache Enterprise Users	Allows all users previously set up on the system to log in even if the site network is down.
Enable Enterprise Authentication	Verifies users and what privileges they have based on the network settings at your site.
Enable Authorization	For facilities with enterprise login, enables checking group membership before allowing users to enter the system. With authorization, you must add user groups to the group tab in order to let people log in.
[APPLY CONFIGURATION]	Applies the settings.
[RESTORE]	Restores the setting to the last applied configuration. That is, when the [APPLY CONFIGURATION] button was last clicked.

Configure Enterprise Authorization

The Configure-Enterprise Tab is used by the site's IT (Information Technology) or GE Service personnel. It provides connectivity to the site's user database. If you do not have a network established in your facility, this tab will not be used.

When the fields on the left side of the screen are completed, press [GENERATE DEFAULTS] to auto-populate the fields on the right side with suggested defaults. Modify the information as appropriate.

Press [APPLY CONFIGURATION] to apply the settings.

The [RESTORE] button resets the tab to the last saved settings.

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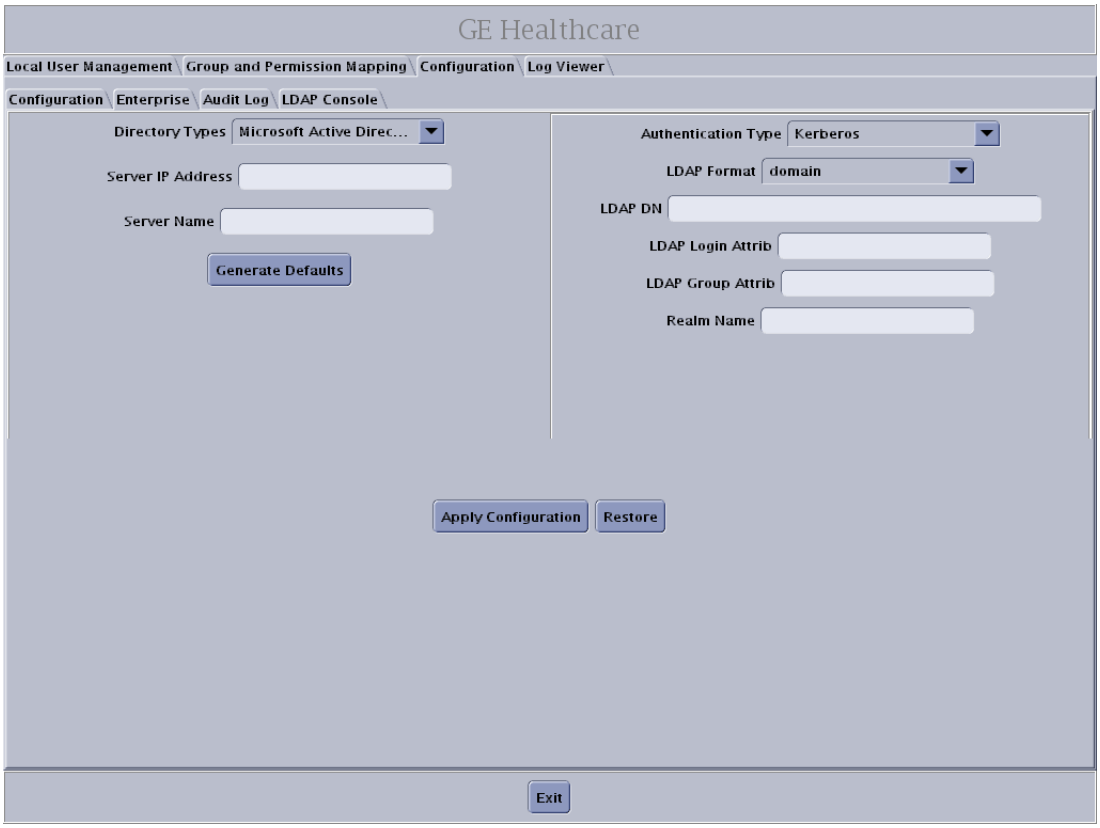
Figure B-11 Configuration-Enterprise tab



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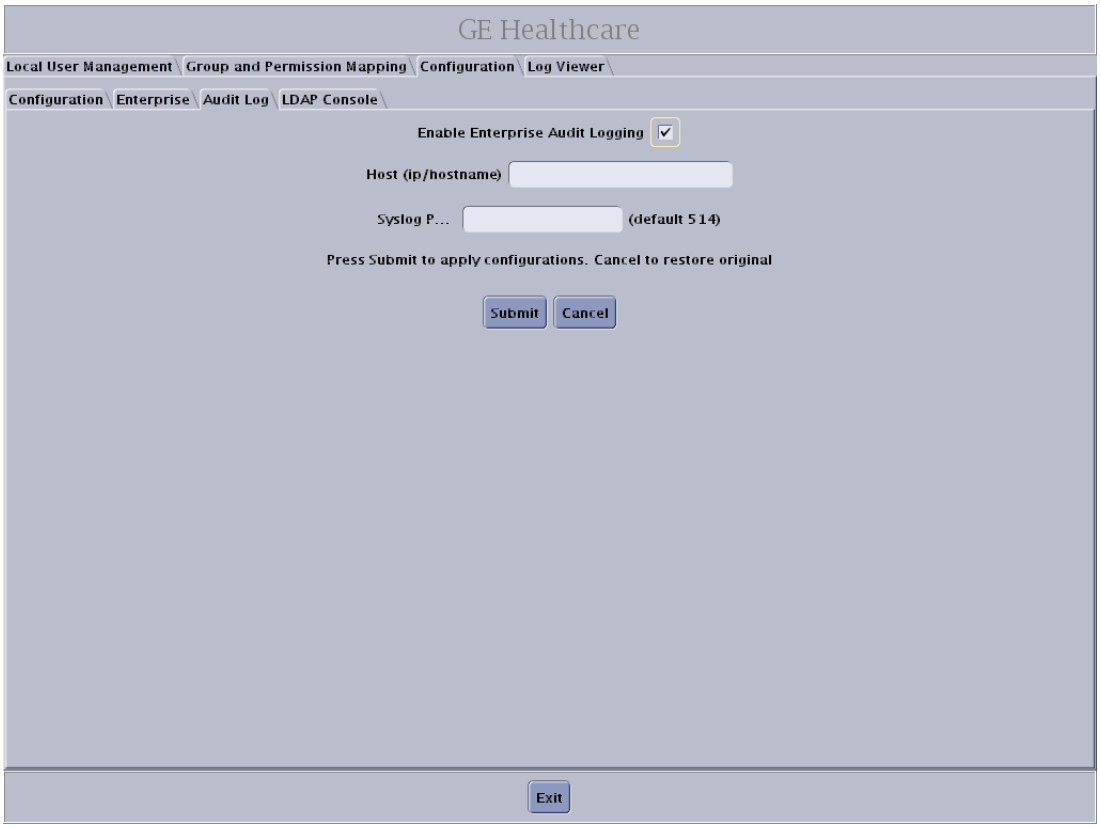
Configure Audit Log

If enterprise authorization is enabled, this tab controls if audit logging is to be enables, which hosts will be tracked, and the number of events to track.

Click [SUBMIT] to apply the settings.

Figure B-12 Configuration -Audit Log tab



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Use LDAP Console

Lightweight Directory Access Protocol (LDAP) functions are available from the Configuration-LDAP Console tab.

Figure B-13 Configuration-LDAP Console tab

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